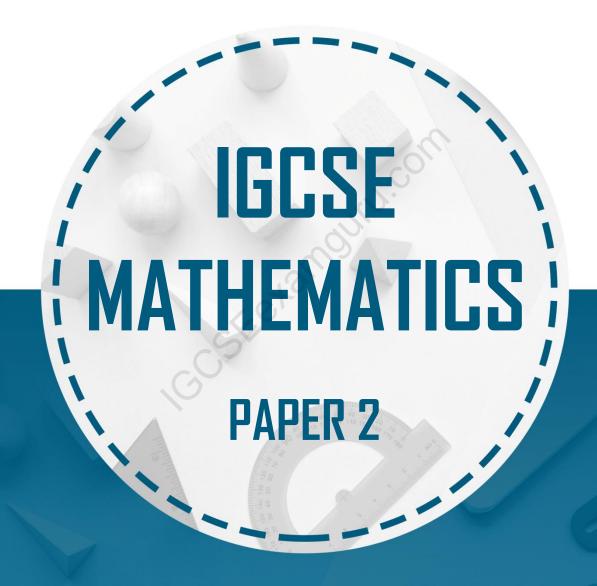


TOPICAL PRACTICE QUESTIONS



STUDENT COPY 2020 EDITION 2012-2015 VOL. 2

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1 The price of a ticket for a football match is \$124.

May June 2012 Code 21

(a) Calculate the amount received when 76500 tickets are sold.

Answer(a) \$ [1]

(b) Write your answer to part (a) in standard form.

Answer(b) \$ [1]

Gregor changes \$700 into euros (\mathfrak{E}) when the rate is $\mathfrak{E}1 = \$1.4131$.

Calculate the amount he receives.

May June 2012 Code 21

Answer €

можну жутамининациям ченере порежден в размения подострой женициями измана, чен на таки

May June 2012 Code 21

Write the following in order of size, smallest first.

0.47 $\frac{8}{17}$ $\sqrt{0.22}$ tan 25

Answer ____ < __ < [2]

4	The sides of a rectangle are 6.3 cm and 4.8 cm, each correct to 1 decim	al place.
	Calculate the upper bound for the area of the rectangle.	May June 2012 Code 21
	Answer	cm ² [2]
5	Shania invests \$750 at a rate of $2\frac{1}{2}$ % per year simple interest. Calculate the total amount Shania has after 5 years.	May June 2012 Code 21
	Answer \$	
	duction \$	[3]

6 The scale of a map is 1:500000.

May June 2012 Code 21

(a) The actual distance between two towns is 172 km.

Calculate the distance, in centimetres, between the towns on the map.

Answer(a) _____ cm [2]

(b) The area of a lake on the map is 12 cm².

Calculate the actual area of the lake in km².

Answer(b) km² [2]

7	The ferry from Helsinki to Travemunde leaves Helsinki at 1730 on a Tuesday. The journey takes 28 hours 45 minutes.					
	Work out the day and time that	the ferry arrives	in Travemu	nde.	May June 2012 Code	9 22
	Answer	Day	***************************************	Time		[2]
8	For this question, $1 < x < 2$.	RADIOTALIST ST. T. T. ST. ST. ST. SHEWAY &	error oprious a cultural such titus	ent tin salast mirrosale messikan kukiculus oli iliki	iki. Tili suka si Abdangab <mark>Pangangangang bakabah</mark> anan punan ari suka na menggop	TOOM SUIDE ON
	Write the following in order of	size, smallest fir	st.		May June 2012 Code	22
	$\frac{5}{x}$	5 <i>x</i>	$\frac{x}{5}$	<i>x</i> – 5		
		Answer			<	[2]
9	The taxi fare in a city is \$3 and	then \$0.40 for e	very kilome	tre travelled.	ras en	CONTRACTOR
	(a) A taxi fare is \$9.				May June 2012 Code	22
	How far has the taxi travel	led?	illio		May 54116 2012 5546	
		Let				

(b) Taxi fares cost 30% more at night.

How much does a \$9 daytime journey cost at night?

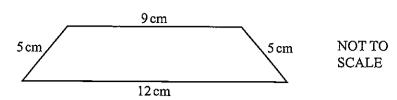
Inswer(b) \$ _____[2]

IGC	SE - Cambridge	MATHEMATICS - P2	Ch1 - Numbers
10	A lake has an area of 63 80		May June 2012 Code 22
	write inis area in square ki	ilometres, correct to 2 significant figures.	
		Answer	km² [2]
	enden i ing mangangan darah darah kan an ing mangan darah	THE THE CONTRACT OF THE PROPERTY OF A PROPERTY OF THE PROPERTY	contraction and case and a series to the contraction and an analysis and a series of the contraction and a series of the contr
11	Hans invests \$750 for 8 year	ars at a rate of 2% per year simple interest.	
	Calculate the interest Hans	receives.	
			May June 2012 Code 23
			<u>(()</u>
		Answer \$	[2]
12	(a) Calculate $\sqrt[3]{7^{1.5} + 22^6}$	and write down your full calculator dis	play.
			May June 2012 Code 23

(b) Write your answer to part (a) correct to 4 significant figures.

[1]

13



The diagram shows a quadrilateral.

The lengths of the sides are given to the nearest centimetre.

May June 2012 Code 23

Calculate the upper bound of the perimeter of the quadrilateral.

Answer	cm	[2]
22.00 () 01	 ~ 111	

During her holiday, Hannah rents a bike. She pays a fixed cost of \$8 and then a cost of \$4.50 per day. Hannah pays with a \$50 note and receives \$10.50 change.

May June 2012 Code 23

Calculate for how many days Hannah rents the bike.

...

Answer days [3]

Boris invests \$280 for 2 years at a rate of 3% per year compound interest.

Calculate the interest Boris receives at the end of the 2 years. Give your answer correct to 2 decimal places.

May June 2012 Code 23

Oct Nov 2012 Code 21

16 Use your calculator to find the value of

$$\frac{8.1^2 + 6.2^2 - 4.3^2}{2 + 6.1 + 6.2}$$

- Without using your calculator, work out the following.

 Show all the steps of your working and give each answer as a fraction in its simplest form.
 - (a) $\frac{11}{12} \frac{1}{3}$

May June 2012 Code 23

Answer(a) [2]

(b) $\frac{1}{4} \div \frac{11}{13}$

Answer(b) [2]

On a mountain, the temperature decreases by 6.5 °C for every 1000 metres increase in height. At 2000 metres the temperature is 10 °C.

Find the temperature at 6000 metres.

Oct Nov 2012 Code 21

Answer °C [2]

IGC	SE - Cambridge	MATHEMATICS - P2	Ch1 - Numbers			
19	The train fare from Bang The exchange rate is £1 =	kok to Chiang Mai is 768 baht. = 48 baht.	Oct Nov 2012 Code 21			
	Calculate the train fare ir	n pounds (£).				
		Answer £	[2]			
MELALIZA OO			go-manny saon-re-mark an the polystylensis phanesis hand an Araban Association and Association and Association			
20		years at a rate of 2.8% per year compound i	interest.			
	Calculate the final amour	nt he has after 3 years.	Oct Nov 2012 Code 21			
contain a latin		Answer \$	[3]			
21		s 25 litres of water correct to the nearest litr 3 litres correct to the nearest 0.1 litre.	e.			
	Calculate the lower bound for the number of glasses of water which can be filled from the bottle.					
			Oct Nov 2012 Code 21			
		Answer	[3]			

IGC	SE - Cambridge	MATHEMATICS - P2	Ch1 - Num	bers
22	Write the following numb	pers correct to one significant figure.		
	(a) 7682		Oct Nov 2012 Code	22
		Answer(a)	•••••	[1]
	(b) 0.07682			
		Answer(b)	***************************************	[1]
23	Work out 11.3139 – 2.28	$ imes \sqrt[3]{9^2}$.	Oct Nov 2012 Code	22
	Give your answer correct	to one decimal place.		
		MOJIII.C		
:	inger T	Answer		[2]
24		lingapore has a viewing capsule which hole population of Singapore when it was four of Singapore in 1819?		SA MICHIGAN CO.
			Oct Nov 2012 Code	22
		Answer .		[2]

IGCS	SE - Cambridge	MATHEMAT	FICS - P2	Ch1 - Nu	umbers
25	82 000 correct to the ne	600 Rand (R) to attend the			nount
				Oct Nov 2012 Cod	de 22
	•				
			Answer R		[3]
26	A shop is open during t	the following hours.	angun angun angun anggapanan ang ang ang ang ang ang ang ang ang	anning green of the second desired and second desir	1121 4 11 115 2
		Monday to Friday	Saturday	Sunday	
	Opening tim	e 0645	0730	0845	

(b) Calculate the total number of hours the shop is open in one week.

Answer(b) h [2]

27 Samantha invests \$600 at a rate of 2% per year simple interest.

- Calculate the interest Samantha earns in 8 years.

Oct Nov 2012 Code 23

Answer \$[2]

Jamie needs 300 g of flour to make 20 cakes.

How much flour does he need to make 12 cakes?

Oct Nov 2012 Code 23

Answer _____

29 Maria pays \$84 rent. The rent is increased by 5%.

Oct Nov 2012 Code 23

Calculate Maria's new rent.

4nswer \$[2]

30 A carton contains 250 ml of juice, correct to the nearest millilitre.

Complete the statement about the amount of juice, j ml, in the carton.

Answer $\leq i <$ [2]

Oct Nov 2012 Code 23

Answer min [2]

35 An equilateral triangle has sides of length 16.1 cm, correct to the nearest millimetre.

Find the lower and upper bounds of the perimeter of the triangle.

May June 2013 Code 21

Answer Lower bound = cm

Upper bound = cm [2]

IGCSE	_	Cambr	idae
I WOOL	_	Vallion	uuc

Ch1 - Numbers

36 Write $(27x^{12})^{\frac{1}{3}}$ in its simplest form.

May June 2013 Code 21

Answer[2]

Martina changed 200 Swiss francs (CHF) into euros (ϵ). The exchange rate was $\epsilon 1 = 1.14$ CHF.

May June 2013 Code 21

Calculate how much Martina received. Give your answer correct to the nearest euro.

Answer €......[3]

38 Bruce invested \$420 at a rate of 4% per year compound interest.

Calculate the **total** amount Bruce has after 2 years. Give your answer correct to 2 decimal places.

May June 2013 Code 21

Answer \$.....[3]

IGCSE	_	Cam	bridae	3
IOOOL		Oam	viiuq.	

Ch1 - Numbers

A water pipe has a circular cross section of radius 0.75 cm. Water ows through the pipe at a rate of 16 cm/s.

May June 2013 Code 21

Calculate the time taken for 1 litre of water to ow through the pipe.

Answer s [3]

40 Calculate $(4.3 \times 10^8) + (2.5 \times 10^7)$.

May June 2013 Code 22

Give your answer in standard form.

IGCSE -	Cambridge
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Ch1 - Numbers

George and his friend Jane buy copies of the same book on the internet.

George pays \$16.95 and Jane pays £11.99 on a day when the exchange rate is \$1 = £0.626.

Calculate, in dollars, how much more Jane pays.

May June 2013 Code 22

		Answer \$[2]	
42	(a)	Use your calculator to work out $\sqrt{65}-1.7^2$. May June 2013 Code 22	<u></u>
		Write down all the numbers displayed on your calculator.	
		Answer(a)[1]	
	(b)	Write your answer to part (a) correct to 2 signi cant gures.	
	:	Answer(b)[1]	

Joe measures the side of a square correct to 1 decimal place.

He calculates the **upper** bound for the area of the square as 37.8225 cm².

Work out Joe's measurement for the side of the square.

May June 2013 Code 22

Answer cm [2]

Without using a calculator, work out $\frac{6}{7} \div 1\frac{2}{3}$.

Write down all the steps in your working.

May June 2013 Code 22

Answer[3]

Calculate the total amount Carol has after 3 years.

May June 2013 Code 22

Answer \$ [3]

46 Sheila can pay her hotel bill in Euros (€) or Pounds (£). The bill was 6425 or £365 when the exchange rate was £1 = 61.14.

May June 2013 Code 23

In which currency was the bill cheaper? Show all your working.

Answer[2]

The time in Lisbon is the same as the time in Funchal.
A plane left Lisbon at 08 30 and arrived in Funchal at 10 20.
It then left Funchal at 12 55 and returned to Lisbon.
The return journey took 15 minutes more.

May June 2013 Code 23

What time did the plane arrive in Lisbon?

Answer [2]

48 Use a calculator to nd

May June 2013 Code 23

(a) $\sqrt{5\frac{5}{24}}$,

Answer(a)[1]

(b) $\frac{\cos 40^{\circ}}{7}$

Answer(b) [1]

G Sketan

49 Write the following in order of size, smallest rst.

May June 2013 Code 23

 $(1.5)^{\frac{2}{3}}$

 $\left(\frac{2}{3}\right)^{1.5}$

 $\left(\frac{2}{3}\right)^{-1.5}$

 $\left(-\frac{2}{3}\right)^{\frac{2}{3}}$

50 Calculate, giving your answers in standard form,

May June 2013 Code 23

(a) $2 \times (5.5 \times 10^4)$,

Answer(a)[2]

(b) $(5.5 \times 10^4) - (5 \times 10^4)$.

Answer(b)[2]

51 The sum of the prime numbers less than 8 is equal to 17.

May June 2013 Code 23

(a) Find the sum of the prime numbers less than 21.

Inswer(a)[2]

(b) The sum of the prime numbers less than x is 58.

Find an integer value for x.

 $Answer(b) x = \dots [2]$

IGC:	SE - Cambridge	MATHEMATICS	- P2	Ch1 - Number
52	Work out 72 cents as a percent	entage of 83 cents.		Oct Nov 2013 Code 21
			Answer	% [1]
53	Calculate $\frac{5.27 - 0.93}{4.89 - 4.07}$.	MMEMA (EEE) (EER) (LAAP TE (AAN AARSTEN ARREST ARRE	AA-AA-AA-AA (PIR MANIBOOMININA WORLD-PERENT) TITTI AAA-AA-AA-AA-AA	and das <mark>1884 s. A. A. Pri Kaus Bass neg</mark> res (g. y. 6 a. p. e reservor (m. y. mémbro (g. Bigliottable) phan
	Give your answer correct t	o 4 signi cant gures.		Oct Nov 2013 Code 21
			Answer	[2]
54	Calculate 17.5% of 44 kg.		,U.COM	Oct Nov 2013 Code 21
		etaine	Angwar	kg [2]
eckinim re	kaat kaas biiraatiinaa kiiraa kaasii kaa	CONTRACTOR OF THE STATE OF THE	ALLES MEL	> conscious transporter of the contract of the
55	The length, $p \text{ cm}$, of a car is Complete the statement above		est 10 cm.	Oct Nov 2013 Code 21

Answer $\leq p <$ [2]

Emily invests x at a rate of 3% per year simple interest. After 5 years she has \$20.10 interest.

Oct Nov 2013 Code 21

Find the value of x.

Answer x =	•••••••••••••••••••••••••••••••••••••••	[3]
ANNEL CONTROL	CTI. I JAA' II.JA MELI MENINGAN MENINGA	MAX SURVEY AND
of size smallest rot		

57 Write the following in order of size, smallest rst.

Oct Nov 2013 Code 22

19% $\frac{1}{5}$ $\sqrt{0.038}$ sin 11.4° 0.719

58 Use a calculator to work out the following.

Oct Nov 2013 Code 22

(a)
$$3(-4 \times 6^2 - 5)$$

Answer(a)[1]

(b) $\sqrt{3} \times \tan 30^{\circ} + \sqrt{2} \times \sin 45^{\circ}$

Answer(b)[1]

59 The table shows how the dollar to euro conversion rate changed during one day.

Time	1000	1100	1200	13 00	1400	15 00	1600
\$1	€1.3311	€1.3362	€1.3207	€1.3199	€1.3200	€1.3352	€1.3401

Khalil changed \$500 into euros (€).

How many more euros did Khalil receive if he changed his money at the highest rate compared to the lowest rate?

Oct Nov 2013 Code 22

Answer € [3]

A circle has a radius of 8.5 cm correct to the nearest 0.1 cm. The lower bound for the area of the circle is $p\pi$ cm². The upper bound for the area of the circle is $q\pi$ cm².

Oct Nov 2013 Code 22

Find the value of p and the value of q.

Answer
$$p = \dots$$
 $q = \dots$ [3]

- Pam wins the student of the year award in New Zealand.
 She sends three photographs of the award ceremony by post to her relatives.
 - one of size 13 cm by 23 cm to her uncle in Australia

• one of size 15 cm by 23 cm to her sister in China

Oct Nov 2013 Code 22

• one of size 23 cm by 35 cm to her mother in the UK

Maximum lengths	Australia	Rest of the world
13 cm by 23.5 cm	\$1.90	\$2.50
15.5 cm by 23.5 cm	\$2.40	\$2.90
23 cm by 32.5 cm	\$2.80	\$3.40
26 cm by 38.5 cm	\$3.60	\$5.20

The cost of postage is shown in the table above. Use this information to calculate the total cost.

10,3401	Answer \S	[3]
62	Christa had a music lesson every week for one year. Each of the 52 lessons lasted for 45 minutes.	Oct Nov 2013 Code 23
	Calculate the total time that Christa spent in music lessons. Give your time in hours.	
- 1-4-40 species 50 de	Answei	r h [2]
63	Write the following in order of size, smallest rst.	Oct Nov 2013 Code 23
	$\cos 100^{\circ}$ $\tan 100^{\circ}$ $\frac{1}{100}$ 10	00-0.1
	Answer<	[2]

64 Write

(a) 60 square metres in square centimetres,

Oct Nov 2013 Code 23

Answer(a) cm² [1]

(b) 22 metres per second in kilometres per hour.

Answer(b) km/h [2]

In 2012 the cost of a ticket to an arts festival was \$30. This was 20% more than the ticket cost in 2011.

Oct Nov 2013 Code 23

Calculate the cost of the ticket in 2011.

Answer \$[3]

Write the answer to the following calculations in standard form.

(a) $600 \div 8000$

Oct Nov 2013 Code 23

Answer(a) [2]

(b) $10^8 - 7 \times 10^6$

Answer(b)[2]

67 Use your calculator to work out $\sqrt{\frac{3}{4}} + 2^{-1}$.

May June 2014 Code 21

Give your answer correct to 2 decimal places.

Answer [2]

68 $y = \frac{2}{x^2} + \frac{x^2}{2}$

Find the value of y when x = 6. Give your answer as a mixed number in its simplest form. May June 2014 Code 21

 $Answer y = \dots [2]$

69

$$p = \frac{4.8 \times 1.98276}{16.83}$$

(a) In the spaces provided, write each number in this calculation correct to 1 signi cant gure.

Answer(a)

.....×

May June 2014 Code 21

.....

. [1]

(b) Use your answer to part (a) to estimate the value of p.

Answer(b)[1]

70 Write the following in order of size, smallest rst.

 0.5^{2}

0.5

 0.5^{3}

 $\sqrt[3]{0.5}$

May June 2014 Code 21

71 Carlo changed 800 euros (ϵ) into dollars for his holiday when the exchange rate was $\epsilon 1 = 1.50$. His holiday was then cancelled.

He changed all his dollars back into euros and he received €750.

Find the new exchange rate.

May June 2014 Code 21

Answer $\epsilon_1 = \$$ [3]

A bus company in Dubai has the following operating times.

May June 2014 Code 21

Day	Starting time	Finishing time
Saturday	0600	24 00
Sunday	0600	24 00
Monday	06 00	24 00
Tuesday	0600	2400
Wednesday	0600	2400
Thursday	06 00	24 00
Friday	13 00	2400

(a) Calculate the total number of hours that the bus company operates in one week.

Answer(a)	 h	[3]

(b) Write the starting time on Friday in the 12-hour clock.

Answer(b) [1]

IGCSE	- Ca	mbr	idae

Ch1 - Numbers

73 Calculate $\frac{\sqrt[3]{16}}{1.3^2}$.

May June 2014 Code 22

Answer [1]

74 (a) Write 569 000 correct to 2 signi cant gures.

May June 2014 Code 22

Answer(a) [1]

(b) Write 569 000 in standard form.

Answer(b)[1]

75 Solve the simultaneous equations.

$$2x - y = 7$$
$$3x + y = 3$$

May June 2014 Code 22

Answer $x = \dots$

y = [2]

76 The mass of 1 cm³ of copper is 8.5 grams, correct to 1 decimal place.

May June 2014 Code 22

Complete the statement about the total mass, T grams, of $12 \, \mathrm{cm}^3$ of copper.

Answer $\leq T <$ [2]

77 Write the following in order, smallest rst.

May June 2014 Code 22

 $\sqrt{0.1}$ $\frac{43}{201}$ $2\frac{1}{2}\%$ 0.3

At the beginning of July, Kim had a mass of 63 kg. At the end of July, his mass was 61 kg.

May June 2014 Code 22

Calculate the percentage loss in Kim's mass.

Answer % [3]

IGCS	SE - Cambridge	MATHEMATICS - P2	Ch1 - Numb	ers
79	Anita buys a computer for The sale price is 15% less		May June 2014 Code 2	22
	Calculate the original price	of the computer.		
			Answer \$	[3]
80	In March 2011, the average In March 2012, the average	temperature in Kiev was 3°C. temperature in Kiev was 19°C lowe	er than in March 2011.	
	Write down the average ter	nperature in Kiev in March 2012.	(°CO),	
		OUN	Answer°C	[1]
ngga sahigang di 1157	in na 1 1000 astronos Sandrinnis kala kankintsissä. Hot e et siste – 1 1115 ja nek	тыруучунун байын байын байын бүсүн бүйүн байын	May June 2014 Code 2	23
81		euros (ϵ) when $\epsilon_1 = 1.313$.		
	Calculate how much he re-	eives.	May June 2014 Code 2	23
		4	Answer €	[2]

82	(a)	Use your calculator to	nd the value of	$7.5^{-0.4} \div \sqrt{57}$
		Write down your full ca	alculator display.	

May June 2014 Code 23

(b) Write your answer to part (a) in standard form.

Hans draws a plan of a eld using a scale of 1 centimetre to represent 15 metres. The actual area of the eld is $10\,800\,\mathrm{m}^2$.

Calculate the area of the eld on the plan.

May June 2014 Code 23

84 Solve the inequality.

$$5t + 23 < 17 - 2t$$

May June 2014 Code 23

85 A rectangle has length 127.3 cm and width 86.5 cm, both correct to 1 decimal place.

Calculate the upper bound and the lower bound for the perimeter of the rectangle.

May June 2014 Code 23

Answer Upper bound = cm

Lower bound = cm [3]

86 Use your calculator to nd the value of 1.35^7 .

Give your answer correct to 5 signi cant gures.

Oct Nov 2014 Code 21

Answer [2]

87 Write the following in order of size, smallest rst.

3.14

22

3.142

Oct Nov 2014 Code 21

Answer < [2]

smallest

88 Without using a calculator, work out $\frac{1}{4} + \frac{1}{6}$.

Write down all the steps in your working and give your answer as a fraction in its simplest form.

Oct Nov 2014 Code 21

		Answer[2	2
89	Write 15.0782 correct to	He had do a second deficit did a second deficit de la second de la constant de la	A::L:
	(a) one decimal place,	Oct Nov 2014 Code 2	1
	(b) the nearest 10.	Answer(a)[1]
		Answer(b)	17

Answer \$ [3]

Oct Nov 2014 Code 22

Answer [1]

95 The length, *l* metres, of a football pitch is 96 m, correct to the nearest metre.

Complete the statement about the length of this football pitch.

Oct Nov 2014 Code 22

Answer $\leq l <$ [2]

For her holiday, Alyssa changed 2800 Malaysian Ringgits (MYR) to US dollars (\$) when the exchange rate was 1 MYR = \$0.325.

At the end of her holiday she had \$210 left.

Oct Nov 2014 Code 22

(a) How many dollars did she spend?

Answer(a) \$..... [2]

(b) She changed the \$210 for 750 MYR.

What was the exchange rate in dollars for 1 MYR?

Answer(b) 1 MYR = \$......[1]

97 Without using a calculator, work out $1\frac{1}{6} \div \frac{7}{8}$.

Show all your working and give your answer as a fraction in its lowest terms.

Oct Nov 2014 Code 22

Anguar [3]

IGC:	SE - Cambridge	MATHEMATICS - P2	Ch1 - Numbers
98	(a) Write 90 as a product of p	prime factors.	Oct Nov 2014 Code 22
		Answer(a) .	[2]
	(b) Find the lowest common	multiple of 90 and 105.	
بد در دوسه دوس	The second of the second secon	Answer(b).	[2]
99	Alex invests \$200 for 2 years Chris invests \$200 for 2 years	at a rate of 2% per year simple interest. at a rate of 2% per year compound interest.	
·	Calculate how much more into	·//·	Oct Nov 2014 Code 22
	•	CSF. EXAMOUNT	
owną raknosą, ko naj	TO THE A SOCIAL PROPERTY AND A SOCIAL SECTION OF THE SOCIAL PROPERTY AND A SOCIAL PROPER	Answer \$.	[4]
100	\$1 = 8.2 rand		Oct Nov 2014 Code 23
	Change \$350 into rands.		rand [2]

IGC	SE - Cambridge	N	MATHEMAT	TICS - P2		Ch1 - Nur	mbers
101	Write the following in o	order of size, smal	llest rst.				
		0.34	$\sqrt{0.6}$	0.6^{2}	0.73		
						Oct Nov 2014 Code	e 23
		Answe	ersmalles		<	<	[2]
ana s embrique	a tata nimana na	rUobdatJesugbinini "Prigrandiseticaeedida	ann an am	a innergent and	ie aus aus a tires arines a auses ause	en esta una esta esta e esta consecuencia esta esta con	000000000000000000000000000000000000000
102	Work out $4 \times 10^{-5} \times 6$ Give your answer in sta					Oct Nov 2014 Code	e 23
					Answer		[2]
103	A train takes 65 minute	s to travel 52 km.	general george et general () a () a () a () a () a () a () a () a () a () a () a () a () a () a (en engagon e e e e e e e e e e e e e e e e e e e	e de la companya	; : : : : : : : : : : : : : : : : : : :
	Calculate the average sp	peed of the train i	n kilometre	s per hour.			
		c×	eta			Oct Nov 2014 Code	e 23

	- Cambridge	MATHEMATICS - P2	Ch1 - Numbers
7		o start a business. rate of 5% per year compound interest. kk at the end of the 3 years.	Oct Nov 2014 Code 23
(Calculate the total amount	to be paid back.	

60 TOOT 80,808	VIANAMANANANANANANANANANANANANANANANANANA		Answer \$[3]
105	At noon the temperature was 4°C		
	At midnight the temperature was		May June 2015 Code 21
	Work out the difference in temper	rature between noon and mid	night.
II III MUMAAA			Answer°C [1]
106	Use your calculator to work out	$\sqrt{10 + 0.6 \times (8.3^2 + 5)}.$	May June 2015 Code 21
× **** ***	enenderfeld Hill Eldenska in mensemmen er		Answer[1]
107	Write 270 000 in standard form.		
			Answer[1]

May June 2015 Code 21

Rice is sold in 75 gram packs and 120 gram packs.

The masses of both packs are given correct to the nearest gram.

May June 2015 Code 21

Calculate the lower bound for the difference in mass between the two packs.

Answer		g	[2]
--------	--	---	-----

109 A car travels a distance of 1280 metres at an average speed of 64kilometres per hour.

Calculate the time it takes for the car to travel this distance. Give your answer in **seconds**.

May June 2015 Code 21

Answer s [3]

IGC:	SE - Cambridge	MATHEMATICS - P	2	Ch1 - Number
110	Georg invests \$5000 for 14	years at a rate of 2% per year co	mpound interest.	
	Calculate the interest he reco		Ma	y June 2015 Code 21
2	MM-2-17Cs 11-122 , i.e., i		Answer \$	[4]
111	(a) Write 30 as a product of	f its prime factors.	May	y June 2015 Code 21
	•		Answer(a)	[2]
	(b) Find the lowest commo	n multiple (LCM) of 30 and 45.		
		3	Answer(b)	

May June 2015 Code 22

Answer [1]

112 Write 53 400 000 in standard form.

IGC	SE - Cambridge	MATHEMATICS - P2	Ch1 - Numbers
113	A doctor starts work at 2040	and finishes work at 0610 the next day.	
	How long is the doctor at w Give your answer in hours a		May June 2015 Code 22
0.1.		Answer	
114	Write the recurring decimal [0.25 means 0.2555]	0.25 as a fraction.	May June 2015 Code 22
		Ans	wer [2]
errora.co		CONTROL TO THE STORY OF THE STORY OF ST	CASE DOOD THE THOUGH THE THE PROPERTY OF THE
115	One year ago Ahmed's heig Today his height is 120 cm. Both measurements are corn	ht was 114 cm. rect to the nearest centimetre.	May June 2015 Code 22
	Work out the upper bound f	or the increase in Ahmed's height.	
		Ans	rwer cm [2]

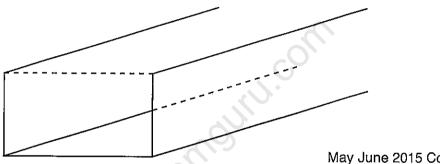
116 Without using a calculator, work out $\frac{4}{5} \div 2\frac{2}{3}$.

Write down all the steps of your working and give your answer as a fraction in its simplest form.

May June 2015 Code 22

Answer[3]

117



May June 2015 Code 22

The diagram shows a channel for water.

The channel lies on horizontal ground.

This channel has a constant rectangular cross section with area 0.95 m².

The channel is full and the water flows through the channel at a rate of 4 metres/minute.

Calculate the number of cubic metres of water that flow along the channel in 3 hours.

Answer m³ [3]

IGCS	SE - Cambridge	MATHEMATICS - P2	Ch1 - Numbers
118	Ahmed and Babar share 240 Calculate the amount Ahme	g of sweets in the ratio 7:3.	May June 2015 Code 23
· avenavaist (s)		Ans	wer g [2]
119	An equilateral triangle has s	ides of length 6.2 cm, correct to the neare	est millimetre.
	Complete the statement abo	ut the perimeter, P cm, of the triangle.	
			May June 2015 Code 23
		Answer	\le P < [2]
	esiminarian esimine domi i omi i omi provisti esimine dell'esimine di esimine	. Good to the other additional and the transfer of the transfe	اند مدينة بين منظم المنظم ا
120	James buys a drink for 2 europe Work out the cost of the dring Give your answer correct to	nk in pounds (£) when £1 = $£1.252$.	May June 2015 Code 23
		Answe	er£[3]
121	In a sale, the cost of a coat i	s reduced from \$85 to \$67.50.	wysta orana - mywyddynyddiai faffiaigi bynniolaeth Sales Labus 3 de eddiait astronomosta dath cae'r cyfrif y dei 2 m. 2 n. 2
		luction in the cost of the coat.	
			May June 2015 Code 23
		Answ	ver % [3]

0580/21/O/N/15

122 At midnight the temperature in Newtown was -8 °C.

At noon the next day the temperature in Newtown was 9 °C.

Work out the rise in temperature from midnight to noon.

Answer °C [1]

0580/21/O/N/15

123 Pip and Ali share \$785 in the ratio Pip:Ali = 4:1.

Work out Pip's share.

Answer \$ [2]

0580/21/O/N/15

By writing each number correct to 1 significant figure, estimate the value of $\frac{\sqrt{3.9 \times 29.3}}{8.9 - 2.7}$.

Show all your working.

Answer [2]

0580/21/O/N/15

125 Work out the highest common factor (HCF) of 36 and 90.

Answer[2]

0580/21/O/N/15

126 Factorise completely.

(a)
$$ax + ay + 3cx + 3cy$$

(b)
$$3a^2 - 12b^2$$

0580/21/O/N/15

Write the recurring decimal 0.15 as a fraction. [0.15 means 0.1555...]

0580/21/O/N/15

128 *V* is directly proportional to the cube of (r + 1). When r = 1, V = 24.

Work out the value of V when r = 2.

Answer
$$V = \dots$$
 [3]

0580/21/O/N/15

129 Make x the subject of the formula.

$$y = ax^2 + b$$

Answer
$$x = \dots$$
 [3]

0580/21/O/N/15

130 A car travels at 56 km/h.

Find the time it takes to travel 300 metres. Give your answer in seconds correct to the nearest second.

Answer s [4]

0580/21/O/N/15

Simplify.

$$\frac{x^2-16}{x^2-3x-4}$$

Answer [4]

IGC	SE - Cambridge	MATHEMATICS - P2		Ch1 - Numbers
058 132	80/21/O/N/15 Hazel invests \$1800 for 7 year	s at a rate of 1.5% per year com	apound interest.	
	Calculate how much interest sl Give your answer correct to the			
			Answer \$	[4]
			coll	
	30/22/O/N/15	emperature between 8°C and –	0°C	
133	write down the difference in the	emperature between 8 C and -	<i>y</i> C.	
			Answer	°C [1]
		1840		
0.70	0.00.00.00.00.00.00	C		
058 1 34	0/22/O/N/15 Carlos changed \$950 into euro	os (€) when the exchange rate w	/as €1 = \$1.368.	
	. (^			
	Calculate how many euros Car	rios receivea.		

0580/22/O/N/15

135 Calculate the volume of a hemisphere with radius 5 cm.

[The volume, V, of a sphere with radius r is $V = \frac{4}{3}\pi r^3$.]

Answer	***************************************	cm ³	[2]
21/10/1/01	*******************************	CIII	12

0580/22/O/N/15

136 Robert buys a car for \$8000.

At the end of each year the value of the car has decreased by 10% of its value at the beginning of that year.

Calculate the value of the car at the end of 7 years.

0580/22/O/N/15

137 The scale on a map is 1:50 000.

The area of a field on the map is 1.2 square centimetres.

Calculate the actual area of the field in square kilometres.

Answer km² [2]

0580/22/O/N/15

Jason receives some money for his birthday.

He spends $\frac{11}{15}$ of the money and has \$14.40 left.

Calculate how much money he received for his birthday.

Answer \$[3

0580/22/O/N/15

139 Without using your calculator, work out $2\frac{1}{4} - \frac{11}{12}$.

You must show all your working and give your answer as a fraction in its lowest terms.

Answer[3]

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MATHEMATICS - P2

Ch1 - Numbers

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140 Jasjeet and her brother collect stamps.

When Jasjeet gives her brother 1% of her stamps, she has 2475 stamps left.

Calculate how many stamps Jasjeet had originally.

Answer[3]

0580/22/O/N/15

141 y is directly proportional to the square of (x-1). y = 63 when x = 4.

Find the value of y when x = 6.

 $Answer\ y = \dots [3]$

0580/22/O/N/15

142 A rectangle has length 5.8 cm and width 2.4 cm, both correct to 1 decimal place.

Calculate the lower bound and the upper bound of the perimeter of this rectangle.

[2]

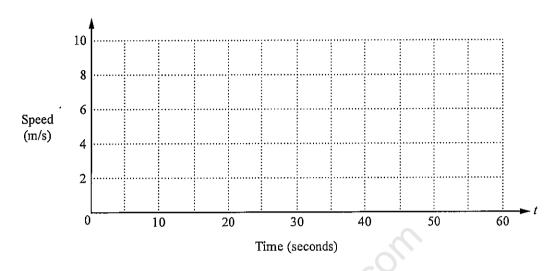
0580/22/O/N/15

143 A car passes through a checkpoint at time t = 0 seconds, travelling at 8 m/s.

It travels at this speed for 10 seconds.

The car then decelerates at a constant rate until it stops when t = 55 seconds.

(a) On the grid, draw the speed-time graph.



(b) Calculate the total distance travelled by the car after passing through the checkpoint.

Answer(b) m [3]

0580/23/O/N/15

- 144 Find the value of
 - (a) $(\sqrt{5})^8$,

Answer(a)[1]

(b) $\left(\frac{1}{27}\right)^{-\frac{2}{3}}$.

IGCSE - Cambridge	MATHEMATICS - P2	Ch1 - Numbers
0580/23/O/N/15 145 Write 168.9 correct to 2 signif	icant figures.	
	Answer	[1]
0580/23/O/N/15 146 Calculate 2.07 – 1.89 5.71 – 3.92		
	Answer	[1]
0580/23/O/N/15 147 Write 1.7×10^{-4} as an ordin	ary number.	
	Answer	[1]
0580/23/O/N/15 148 The probability that it will rain	on any day is $\frac{1}{5}$.	
Calculate an estimate of the nu	amber of days it will rain in a month with 30 days.	
r		
	Answer	[1]
0580/23/O/N/15 149 11	12 13 14 15	16
From the list of numbers, write	e down	
(a) the factors of 60,	-6	
. C	Answer(a)	[1]
(b) the prime numbers.		
	Answer(b)	[1]

0580/23/O/N/15

150 Work out $\frac{2}{3} + \frac{1}{6} - \frac{1}{4}$, giving your answer as a fraction in its lowest terms.

Do not use a calculator and show all the steps of your working.

Answer [3]

0580/23/O/N/15

GCSF.examounin.col 151 y is inversely proportional to $(x+2)^2$. When x = 1, y = 2.

Find y in terms of x.

Answer $y = \dots [2]$

1 Find r when $(5)^{\frac{r}{3}} = 125$.

May June 2012 Code 21

Answer r = [2]

2 Solve the simultaneous equations.

$$3x + 5y = 24$$
$$x + 7y = 56$$

May June 2012 Code 21

 $Answer x = \underline{\hspace{1cm}}$

y = [3]

3 Without using your calculator, work out $1\frac{5}{6} + \frac{9}{10}$.

You must show your working and give your answer as a mixed number in its simplest form.

May June 2012 Code 21

Answer [3]

y is **inversely** proportional to x^2 . When x = 4, y = 3.

May June 2012 Code 21

Find y when x = 5.

 $Answer y = \qquad \qquad [3]$

5 Make w the subject of the formula.

$$c = \frac{4 + w}{w + 3}$$

May June 2012 Code 21

Answer w = [4]

6

$$1\frac{1}{2} + \frac{1}{3} + \frac{1}{4} = \frac{p}{12}$$

May June 2012 Code 22

Work out the value of p.

Show all your working.

Answer p =	***************************************	[2]

7 x is a positive integer and 15x - 43 < 5x + 2.

May June 2012 Code 22

Work out the possible values of x.

8 y varies directly as the square of (x-3). y = 16 when x = 1.

May June 2012 Code 22

Find y when x = 10.

MATHEMATICS - P2

Ch2 - Algebra

9 Solve the inequality.

$$3y + 7 \le 2 - y$$

May June 2012 Code 23

Anguar

[2]

10 Make w the subject of the formula.

$$t=2-\frac{3w}{a}$$

May June 2012 Code 23

Answer w = [3]

The periodic time, T, of a pendulum varies directly as the square root of its length, l. T = 6 when l = 9.

Find T when l = 25.

May June 2012 Code 23

Answer T = [3]

(a) Find the value of 7p-3q when p=8 and q=-5. 12

May June 2012 Code 23

Answer(a) [2]

(b) Factorise completely.

3uv + 9vw

13 Simplify the following.

May June 2012 Code 23

(a) $(4pq^2)^3$

Ar Ar

Answer(b) [2] Solve the equation $2x^2 + 6x - 3 = 0$. Show your working and give your answers correct to 2 decimal places.

May June 2012 Code 23

Answer x = or x = [4]

15 Simplify fully.

$$\frac{x^2 - x - 20}{x^3 - 10x^2 + 25x}$$

May June 2012 Code 23

16 Write down all your working to show that the following statement is correct.

$$\frac{1+\frac{8}{9}}{2+\frac{1}{2}}=\frac{34}{45}$$

Oct Nov 2012 Code 21

Answer

[2]

[3]

17 Simplify the expression.

$$(a^{\frac{1}{2}}-b^{\frac{1}{2}})(a^{\frac{1}{2}}+b^{\frac{1}{2}})$$

Oct Nov 2012 Code 21

Oct Nov 2012 Code 21

Answer[2]

18 Solve the inequality.

$$\frac{2x-3}{5} - \frac{x}{3} \le 2$$

The electrical resistance, R, of a length of cylindrical wire varies inversely as the square of the 19 diameter, d, of the wire.

R = 10 when d = 2.

Oct Nov 2012 Code 21

Find R when d = 4.

Rearrange the formula $y = \frac{x+2}{x-4}$ to make x the subject. 20

[4]

21

Oct Nov 2012 Code 22

Calculate the exact value of m when h = 20 and a = -5.

Answer m =[2]

IGC	SE - Cambridge	MATHEMATICS -	P2	Ch2 - Al	gebra
22	Solve the equation	4x - 12 = 2(11 - 3x).		Oct Nov 2012 Code	9 22
			COIL		
harryood b sid a Gon ea	TO THE OWNER OF THE STATE OF TH	1986 (O k.d. + sundo sum as sur hamilian limit substitution de significant (o.y. propers ; rose ; rose o sum op et (0.00 d. 1886) de la lace de	$Answer x = \dots$		[3]
23	List all the prime nu	umbers which satisfy this inequality	1.		
		16 < 2x - 5 < 48		Oct Nov 2012 Code	22
			Answer		[3]

The mass, m, of an object varies directly as the cube of its length, l.

Oct Nov 2012 Code 22

m = 250 when l = 5.

Find m when l = 7.

$$Answer m = [3]$$

25 (a)
$$\left(\frac{3}{8}\right)^{\frac{3}{8}} \times \left(\frac{3}{8}\right)^{\frac{1}{8}} = p^q$$

Oct Nov 2012 Code 22

Find the value of p and the value of q.

Answer(a)
$$p =$$
 [2]

(b)
$$5^{-3} + 5^{-4} = k \times 5^{-4}$$

Find the value of k.

$$Answer(b) k =$$
 [2]

26 Show that $\left(\frac{1}{10}\right)^2 + \left(\frac{2}{5}\right)^2 = 0.17$.

Oct Nov 2012 Code 23

Write down all the steps in your working.

Answer

[2]

27 Expand the brackets.

$$y(3-y^3)$$

Oct Nov 2012 Code 23

Answer [2]

28 Find the value of $\frac{7.2}{11.8-10.95}$

Oct Nov 2012 Code 23

Give your answer correct to 4 significant figures.

Answer _____[2]

29 Without using a calculator, show that $\left(\frac{49}{16}\right)^{-\frac{3}{2}} = \frac{64}{343}$

Oct Nov 2012 Code 23

Write down all the steps in your working.

Answer

30 Simplify $(256w^{256})^{\frac{1}{4}}$.

Oct Nov 2012 Code 23

Answer [2]

31 Write the following as a single fraction in its simplest form.

Oct Nov 2012 Code 23

$$\frac{x+2}{3} - \frac{2x-1}{4} + 1$$

Answer [3]

IGCSE	_	Cambridge
		Callibliage

MATHEMATICS - P2

Ch2 - Algebra

32 y varies inversely as the square root of x. When x = 9, y = 6.

Oct Nov 2012 Code 23

Find y when x = 36.

Answer y = [3]

33 Make y the subject of the formula.

Oct Nov 2012 Code 23

$$A = \pi x^2 - \pi y^2$$

Answer y = [3]

34 Simplify the following.

$$\frac{h^2 - h - 20}{h^2 - 25}$$

Oct Nov 2012 Code 23

Answer _____[4]

35 Show that $1\frac{1}{2} \div \frac{3}{16} = 8$.

May June 2013 Code 21

Do not use a calculator and show all the steps of your working.

Answer

[2]

36 Factorise completely.

 $12xy - 3x^2$

May June 2013 Code 21

Answer [2]

37 Solve the inequality.

 $3x - 1 \le 11x + 2$

May June 2013 Code 21

Factorise completely.

$$ap + bp - 2a - 2b$$

May June 2013 Code 21

Answer[2]

39 (a) Factorise $x^2 + x - 30$.

May June 2013 Code 21

(b) Simplify

Answer(b) [1]

IGCSE	_	Cam	br	ido	ıe

MATHEMATICS - P2

Ch2 - Algebra

t varies inversely as the square root of u. t = 3 when u = 4.

May June 2013 Code 21

Find t when u = 49.

Answer $t = \dots$ [3]

41 Write as a single fraction in its simplest form.

$$\frac{2}{x+3} + \frac{3}{x+2}$$

May June 2013 Code 21

Answer[3]

IGCSE - Cambridge	MATHEMATICS	- P2 Ch2 - Algebra
42 Factorise completel	y. $kp + 3k + mp + 3m$	May June 2013 Code 22
43 Solve the equation.	5(2y-17)=60	Answer[2] May June 2013 Code 22
		Min Colu

May lun

y is inversely proportional to x^3 . y = 5 when x = 2.

May June 2013 Code 22

Find y when x = 4.

Answer $y = \dots$ [3]

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MA	THE	ΕΜΑ	TICS	- P2

Ch2 - Algebra

45 Use the quadratic equation formula to solve

May June 2013 Code 22

$$2x^2 + 7x - 3 = 0.$$

Show all your working and give your answers correct to 2 decimal places.

46 Solve 6x + 3 < x < 3x + 9 for integer values of x.

May June 2013 Code 22

Answer[4]

The mass, m, of a sphere varies directly with the cube of its radius, r. m = 160 when r = 2.

May June 2013 Code 23

Find m when r = 5.

Answer $m = \dots [3]$

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IOOL		Call		. ~ ~

MATHEMATICS - P2

Ch2 - Algebra

48 Find the value of 2x + y for the simultaneous equations.

May June 2013 Code 23

$$3x + 5y = 48$$
$$2x - y = 19$$

$$Answer 2x + y = \dots [4]$$

Write as a single fraction in its simplest form.

May June 2013 Code 23

$$\frac{x+3}{x-3} - \frac{x-1}{x+1}$$

Answer[4]

50 (a) Solve 3n + 23 < n + 41.

May June 2013 Code 23

Answer(a) [2]

(b) Factorise completely ab + bc + ad + cd.

Answer(b)[2]

51 (a)

$$y = \sqrt{8 + \frac{4}{x}}$$

May June 2013 Code 23

Find y when x = 2.

Give your answer correct to 4 decimal places.

$$Answer(a) y = \dots [2]$$

(b) Rearrange $y = \sqrt{8 + \frac{4}{x}}$ to make x the subject.

Answer(b)
$$x =$$
 [4]

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MATHEMATICS - P2

Ch2 - Algebra

52 Solve the equation.

$$5 - 2x = 3x - 19$$

Oct Nov 2013 Code 21

 $Answer x = \dots [2]$

53 Make b the subject of the formula.

$$c = \sqrt{a^2 + b^2}$$

Oct Nov 2013 Code 21

Answer $b = \dots$ [3]

54 (a) $3^x = \sqrt[4]{3^5}$

Find the value of x.

Oct Nov 2013 Code 21

 $Answer(a) x = \dots [1]$

(b) Simplify $(32y^{15})^{\frac{2}{5}}$

Answer(b)[2]

Write as a single fraction in its simplest form. 55

$$3 - \frac{t+2}{t-1}$$

Oct Nov 2013 Code 21

Answer[3]

Do not use a calculator in this question and show all the steps of your working. 56

Give each answer as a fraction in its lowest terms.

Oct Nov 2013 Code 21

Work out.

(a) $\frac{3}{4} - \frac{1}{12}$

Answer(a) [2]

(b) $2\frac{1}{2} \times \frac{4}{25}$

Answer(b)[2]

Answer(b) s [2]

IGC	SE - Cambridge	MATHEMATICS -	P2 Ch2 - Algebra
59	Find the circumference	of a circle of radius 2.5 cm.	Oct Nov 2013 Code 22
e Novel Model Straft door no	DOT I BERNEUTU UNITE FER BANGA MAN MAKAMAMAN MENENYA MAN MENANTIKA SISTEMBER SERIESTI DIKENJERA MAN SISTEMBER S	O I KO ZIKA WANI MANJAK AFANYI PILITIZI I TEEN KANT (AFANA MANTIN MANJAMBAN MANJAK NEGOTITU	Answer
60	Rearrange the formula t	so make x the subject. $y = x^2 + 4$	Oct Nov 2013 Code 22
3001148888871111000	ентенствення в метеритуру при	А	lnswer x =
61	The speed, ν , of a wave $\nu = 30$ when $d = 400$.	is inversely proportional to the s	quare root of the depth, d , of the water.
	Find ν when $d = 25$.	CO	Oct Nov 2013 Code 22

62 Find the co-ordinates of the point of intersection of the two lines.

$$2x - 7y = 2$$
$$4x + 5y = 42$$

Oct Nov 2013 Code 22

A2002110211	,			`	r 2 1
Answer (, ,	,	**********	,	[ə]

63 Solve the inequality.

$$\frac{x}{2}$$

$$\frac{x}{2} + \frac{x-2}{3} < 5$$

Oct Nov 2013 Code 22

Answer[4]

	Oct Nov 2013 Code 23
	Oct Nov 2013 Code 23
[2]	
a contrata a contrata da contra a la casa de la la contrada de la contrata del contrata de la contrata del contrata de la contrata del la contrata de la contrata del la contrata de la contrata dela contrata del la contrata del la contrata del la contrata del la	Answer x = [2]
	+d=0 are both integers.
ct Nov 2013 Code 23	Oct Nov 2013 Code 23
ot N	Oct N

Answer d=		[3]
-----------	--	-----

66 m varies directly as the cube of x. m = 200 when x = 2.

Oct Nov 2013 Code 23

Find m when x = 0.4.

Answer
$$m = \dots [3]$$

67 (a) Expand and simplify $(a+b)^2$.

Oct Nov 2013 Code 23

Answer(a) [2]

(b) Find the value of $a^2 + b^2$ when a + b = 6 and ab = 7.

Answer(b)[1]

68 (a) Simplify $(64q^{-2})^{\frac{1}{2}}$.

Oct Nov 2013 Code 23

Answer(a) [2]

(b) $5^7 \div 5^9 = p^2$

Find p.

 $Answer(b) p = \dots [2]$

69 Solve the equation.

$$\frac{n-8}{2} = 11$$

May June 2014 Code 21

Answer $n = \dots$ [2]

70 Make x the subject of the formula.

$$y = (x-4)^2 + 6$$

May June 2014 Code 21

 $Answer x = \dots [3]$

71 Write as a single fraction in its simplest form.

May June 2014 Code 21

$$\frac{2}{x} - \frac{2}{x+1}$$

Answer [3]

Factorise completely.

May June 2014 Code 21

(a) ax + ay + bx + by

Answer(a) [2]

(b) $3(x-1)^2 + (x-1)$

 $p = 4 \times 10^{5}$ $q = 5 \times 10^4$ 73

May June 2014 Code 21

Cosketain Find, giving your answer in standard form,

(a) pq,

Answer(a) [2]

Answer(b) [2]

74 Solve the inequality for positive integer values of x. May June 2014 Code 21

$$\frac{21+x}{5} > x+1$$

(a) $(2^{24})^{\frac{1}{2}} = p^4$ 75

May June 2014 Code 21

Find the value of p.

(b) Simplify $\frac{q^2 + q^2}{q^{\frac{1}{4}} \times q^{\frac{1}{4}}}$. [2]

Answer(b)[3]

Without using your calculator, work out $\frac{5}{6} - (\frac{1}{2} \times 1\frac{1}{2})$.

May June 2014 Code 22

Write down all the steps of your working.

 $V = \frac{1}{3}Ah$

May June 2014 Code 22

(a) Find V when A = 15 and h = 7.

CSEPAN (b) Make h the subject of the formula.

Answer(b) h = [2]

78 Solve the equation.

$$\frac{3}{2x} + \frac{1}{x+1} = 0$$

May June 2014 Code 22

Answer x =	***************************************	[3]	1
		ι	

79 w varies inversely as the square root of x. When x = 4, w = 4.

May June 2014 Code 22

Find w when x = 25.

Answer
$$w = \dots [3]$$

80 Factorise completely.

May June 2014 Code 22

(a) $4p^2q - 6pq^2$

Answer(a) [2]

(b) u + 4t + ux + 4tx

nswer(b)[2]

81 (a) Simplify $(3125t^{125})^{\frac{1}{3}}$.

May June 2014 Code 22

(b) Find the value of p when $3^p = \frac{1}{9}$.

(c) Find the value of w when $x^{72} \div x^w = x^8$.

GCSE - Cambridge	MATHEMATICS - P2	Ch2 - Algebra
Simplify. $\frac{x^2 + 6x - 7}{3x + 21}$		May June 2014 Code 22
	Answer	[4]
Factorise completely. 15a³ –	5ab	May lura 0014 Oalla 00
er,	CKSTO!	May June 2014 Code 23
нать моженовах (I жээ мен и инги на магайлага Ментикистим изине е и ист а алгага алгага.	Answer	[2]
Simplify. $3x^2y^3 \times x^4y$		May June 2014 Code 23

85 Without using a calculator, work out $1\frac{1}{4} - \frac{7}{9}$.

May June 2014 Code 23

Write down all the steps in your working.

1nswer	***************************************	[3]

86 y varies as the cube root of (x + 3). When x = 5, y = 1. May June 2014 Code 23

Find the value of y when x = 340.

$$Answer y = \dots [3]$$

(a) Factorise $3x^2 + 2x - 8$.

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Answer(a) [2]

(b) Solve the equation $3x^2 + 2x - 8 = 0$.

Answer(b) x = or x = [1]

88 Robbie pays \$10.80 when he buys 3 notebooks and 4 pencils. Paniz pays \$14.50 when she buys 5 notebooks and 2 pencils.

Write down simultaneous equations and use them to nd the cost of a notebook and the cost of a pencil.

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Answer Cost of a notebook = \$.....

Cost of a pencil = \$..... [5]

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MATHEMATICS - P2

Ch2 - Algebra

Solve the equation. 89

$$\frac{x+5}{x} = \frac{7}{3}$$

Oct Nov 2014 Code 21

					Answer x =	[3]
90	(a)	Simplify	$x^8 \div x^2$.	MINISTER STATE	Oct Nov 2014 Code	21
	(b)	Simplify	$\left(\frac{x^6}{27}\right)^{\frac{1}{3}}.$	CSK. 87	Answer(a)	[1]
				G	Answer(b)	[2]

Solve the simultaneous equations.	0.4x - 5y = 27 $2x + 0.2y = 9$	Oct Nov 2014 Code 21
	Answer x	=
The second of the second secon	у	=[3]
y varies directly with $\sqrt{x+5}$. y=4 when $x=-1$.		Oct Nov 2014 Code 21
Find y when $x = 11$.	etain.	
	y = 4 when $x = -1$.	y varies directly with $\sqrt{x+5}$. y=4 when $x=-1$. Find y when $x=11$.

 $Answer y = \dots [3]$

93 Make r the subject of this formula.

$$v = \sqrt[3]{p+r}$$

Oct Nov 2014 Code 22

Answer $r = \dots [2]$

The cost of a circular patio, C, varies as the square of the radius, r metres. C = 202.80 when r = 2.6.

Calculate the cost of a circular patio with r = 1.8.

Oct Nov 2014 Code 22

95 (a) Write as a single fraction in its simplest form.

 $\frac{3}{2x-1} - \frac{1}{x+2}$

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(b) Simplify.

$$\frac{4x^2 - 16x}{2x^2 + 6x - 56}$$
Answer(b)

Answer(b)[4]

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MATHEMATICS - P2

Ch2 - Algebra

96 Solve the equation.

$$\frac{2x+5}{3}=8$$

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 $Answer x = \dots [3]$

97 Make x the subject of the formula.

$$y = 2 + \sqrt{x - 8}$$

Oct Nov 2014 Code 23

 $Answer x = \dots [3]$

98 y varies inversely as (x + 5). y = 6 when x = 3.

Oct Nov 2014 Code 23

Find y when x = 7.

$$Answer y = \dots [3]$$

99 Write as a single fraction, in its simplest form.

Oct Nov 2014 Code 23

$$\frac{3}{2x} + \frac{2x}{3} + 3 + 2x$$

Answer [4]

IGC	SE - Cambridge	MATHEMATICS -	P2 Ch2 - Algebra	
100	Expand and simplify.	x(2x+3) + 5(x-7)	May June 2015 Code 21	
			Answer[2]	
101	Simplify. $6uw^{-3} \times 4$	иш ⁶	May June 2015 Code 21	
			Answer [2]	
102		lator, work out $1\frac{4}{5} \div \frac{3}{7}$.		
	Show all your working	and give your answer as a fraction i	May June 2015 Code 21	
		.69		

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MATHEMATICS - P2

Ch2 - Algebra

103 p is inversely proportional to the square of (q + 4). p = 2 when q = 2.

May June 2015 Code 21

Find the value of p when q = -2.

Answer p =	•••••	[3]
------------	-------	-----

104 Solve the simultaneous equations. You must show all your working.

$$5x + 2y = -2$$

 $3x - 5y = 17.4$

orise completely. $yp + yt + 2xp + 2xt$	Ма	ay June 2015 Code 21
$7(h+k)^2-21(h+k)$	Answer(a)	[2]
	Answer(b)	[2]
$81^x = 3$ the value of x .	ма	ay June 2015 Code 22
· MA SHOOLYMESHA QAARMASHAANAA SAAN SAAN SAAN SAAN SAAN AHAA ARAA MARKA MERKAPA	Answer $x = \dots$	[1]
t		$1^x = 3$ The value of x . Answer $x = \dots$

 $5(w + 4 \times 10^3) = 6 \times 10^4$

 $Answer w = \dots [2]$

108 Write as a single fraction in its simplest form.

$$\frac{3}{x+2} - \frac{4}{2x-5}$$

109 (a) Find the value of

(i)
$$\left(\frac{1}{4}\right)^{0.5}$$
,

May June 2015 Code 22

Answer(a)(i) [1]

(ii) $(-8)^{\frac{2}{3}}$.

Answer(a)(ii)[1]

(b) Use a calculator to find the decimal value of $\frac{\sqrt{29-3\times32^{0.4}}}{3}$

Answer(b)[1]

IGC	SE - Cambridge	MATHEMATICS - P2	Ch2 - Algebra
110	Factorise completely. $9x^2 - 6x$		May June 2015 Code 23
**************************************	ния политичення димер_{ия запружена поле 100 год 17} 54 г. и 2001 жили инверстивующим может и	Answei	r
111	Factorise $2x^2 - 5x - 3$.		
			May June 2015 Code 23
		Answer	[2]
112	Without using a calculator, work	k out $1\frac{7}{8} \div \frac{5}{9}$.	
	Show all your working and give y	our answer as a fraction in its lowest t	May June 2015 Code 23
gerch ninn auch sind	A Linea James James Bayer ang	Answer	r
113	Solve the equation. $3(x+4) = 2$		
			May June 2015 Code 23

MATHEMATICS - P2

Ch2 - Algebra

114 Simplify.

(a)
$$12x^{12} \div 3x^3$$

(b)
$$(256y^{256})^{\frac{1}{8}}$$

115 Solve the equation.

$$2x^2 + x - 2 = 0$$

Show your working and give your answers correct to 2 decimal places.

Answer
$$x =$$
 or $x =$ [4]

IGCSE - Car	nhridae

MATHEMATICS - P2

Ch2 - Algebra

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116 Factorise completely.

(a)
$$ax + ay + 3cx + 3cy$$

(b)
$$3a^2 - 12b^2$$

0580/21/O/N/15

117 V is directly proportional to the cube of (r + 1). When r = 1, V = 24.

Work out the value of V when r = 2.

0580/21/O/N/15

118 Make x the subject of the formula.

$$y = ax^2 + b$$

$$Answer x = \dots [3]$$

0580/21/O/N/15

119 Simplify.

$$\frac{x^2 - 16}{x^2 - 3x - 4}$$

Answer

0580/22/O/N/15

120 Factorise

(a)
$$9w^2 - 100$$
,

Answer(a)

(b)
$$mp + np - 6mq - 6nq$$
.

Answer(b)

0580/22/O/N/15

121 y is directly proportional to the square of (x - 1). y = 63 when x = 4.

Find the value of y when x = 6.

Answer $y = \dots [3]$

0580/22/O/N/15

122 Solve the equation $5x^2 - 6x - 3 = 0$.

Show all your working and give your answers correct to 2 decimal places.

0580/23/O/N/15 123 Simplify.

1 - 2u + u + 4

Answer [2]

0580/23/O/N/15

124 Factorise completely.

 $2x - 4x^2$

Answer[2]

0580/23/O/N/15

Find the value of 125

(a) $(\sqrt{5})^8$,

Answer(a)[1]

(b) $\left(\frac{1}{27}\right)^{-\frac{2}{3}}$.

Answer(b) [1]

0580/23/O/N/15

126 Write the following as single fractions.

(a)
$$x + \frac{x}{2}$$

(b)
$$x + \frac{2}{x}$$

Answer(b) [1]

0580/23/O/N/15

Make a the subject of the formula $s = ut + \frac{1}{2}at^2$.

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MATHEMATICS - P2

Ch2 - Algebra

0580/23/O/N/15

Simplify. 128

$$\left(\frac{x^{64}}{16y^{16}}\right)^{\frac{1}{4}}$$

Answer[3]

0580/23/O/N/15

GCSF.examourus.com y is inversely proportional to $(x + 2)^2$. 129 When x = 1, y = 2.

Find y in terms of x.

 $Answer y = \dots [2]$

IGCSE - Cambridge	

MATHEMATICS - P2

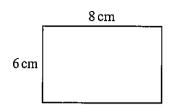
Ch2 - Algebra

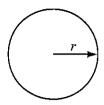
0580/23/O/N/15

Solve the equation $3x^2 + 4x - 5 = 0$.

Show all your working and give your answers correct to 2 decimal places.

Answer y = 0 or y = 4





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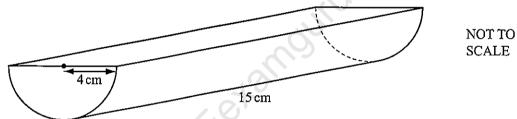
The perimeter of the rectangle is the same length as the circumference of the circle.

Calculate the radius, r, of the circle.

May June 2012 Code 22

Answer r = cm [3]

2



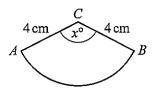
May June 2012 Code 23

The diagram shows a solid prism of length 15 cm.

The cross-section of the prism is a semi-circle of radius 4 cm.

Calculate the total surface area of the prism.

Answer _____ cm² [4]



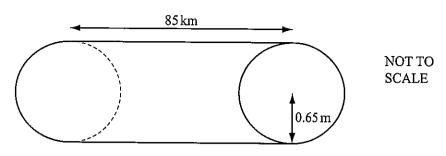
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ABC is a sector of a circle, radius 4 cm and centre C. The length of the arc AB is 8 cm and angle $ACB = x^{\circ}$.

Calculate the value of x.

Answer x = [3]

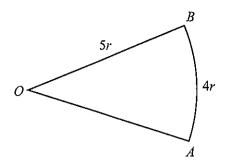


A water pipeline in Australia is a cylinder with radius 0.65 metres and length 85 kilometres.

Calculate the volume of water the pipeline contains when it is full. Give your answer in cubic metres.

Oct Nov 2012 Code 22

Answer	() > 7 = 1 = 1 = 4 = 1 = 1 = 1 = 1 = 1 = 1 = 1	m^3	[3]
	() > 1 = 1 = 1 = 1 = 1 = 1 = 1 = 1 = 1 = 1		[-]



Oct Nov 2012 Code 23

NOT TO SCALE

The diagram shows a sector of a circle, centre O, radius 5r. The length of the arc AB is 4r.

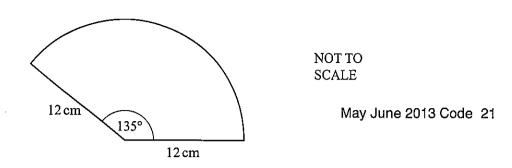
Find the area of the sector in terms of r, giving your answer in its simplest form.

Answer	[3]
--------	-----

6 A sphere has a volume of $80 \, \text{cm}^3$.

May June 2013 Code 21

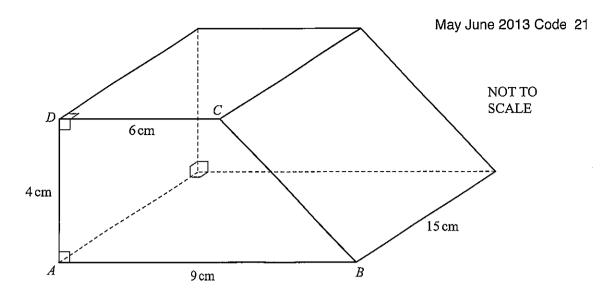
Calculate the radius of the sphere. [The volume, V, of a sphere with radius r is $V = \frac{4}{3}\pi r^3$.]



The diagram shows a sector of a circle of radius 12 cm with an angle of 135°.

Calculate the perimeter of the sector.

Answer		cm	[3]
--------	--	----	-----



The diagram shows a solid prism of length 15 cm. The cross section of the prism is the trapezium ABCD. Angle DAB = angle CDA = 90°. AB = 9 cm, DC = 6 cm and AD = 4 cm.

Calculate the total surface area of the prism.

		_	
Answer	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	cm^2	[5]

5 cm

May June 2013 Code 23

NOT TO **SCALE**

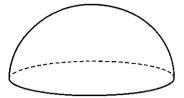
GCSE.eXamouru.com A and B lie on a circle centre O, radius 5 cm. Angle $AOB = 120^{\circ}$.

Find the area of the shaded segment.

Answer cm² [4]

10 The diagram shows a solid hemisphere.





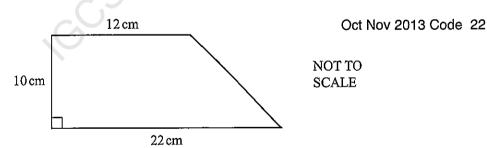
The total surface area of this hemisphere is 243π . The volume of the hemisphere is $k\pi$.

Find the value of k.

[The surface area, A, of a sphere with radius r is $A = 4\pi r^2$.] [The volume, V, of a sphere with radius r is $V = \frac{4}{3}\pi r^3$.]

Answer k =	 [4]
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11



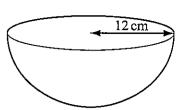
Find the area of the trapezium.

Answer cm^2 [2]

12 A hemisphere has a radius of 12 cm.

Calculate its volume.

[The volume, V, of a sphere with radius r is $V = \frac{4}{3}\pi r^3$.]

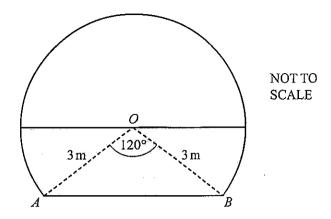


Oct Nov 2013 Code 23

Answer	***************************************	cm^3	[2	1
Answer	***************************************	cm ³	[2)

The diagram shows the entrance to a tunnel. 13 The circular arc has a radius of $3 \,\mathrm{m}$ and centre O. AB is horizontal and angle $AOB = 120^{\circ}$.

Oct Nov 2013 Code 23



During a storm the tunnel lled with water, to the level shown by the shaded area in the diagram.

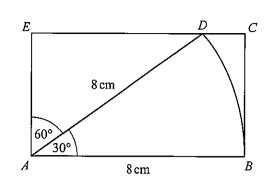
(a) Calculate the shaded area.

Answer(a)	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	m^2	[4]

(b) The tunnel is 50 m long.

Calculate the volume of water in the tunnel.

Answer(b) m³ [1]



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NOT TO **SCALE**

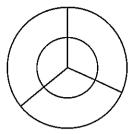
The diagram shows a rectangle ABCE.

D lies on EC.

DAB is a sector of a circle radius 8 cm and sector angle 30°.

Calculate the area of the shaded region.

Answer cm² [7]

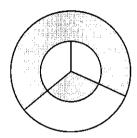


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The diagram shows two concentric circles and three radii. The diagram has rotational symmetry of order 3.

A club uses the diagram for its badge with some sections shaded. The radius of the large circle is 6 cm and the radius of the small circle is 4 cm.

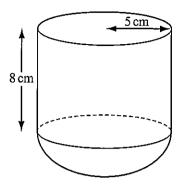


NOT TO SCALE

Calculate the total perimeter of the shaded area.

Answer cm [5]

16 The diagram shows a child's toy.



NOT TO SCALE

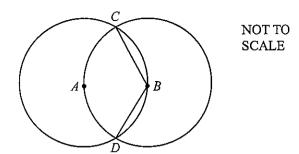
Oct Nov 2014 Code 21

The shape of the toy is a cylinder of radius 5 cm and height 8 cm on top of a hemisphere of radius 5 cm.

Calculate the volume of the toy.

[The volume, V, of a sphere with radius r is $V = \frac{4}{3}\pi r^3$.]

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'Celskall		
	Answer cm ³ [5	i]



Oct Nov 2014 Code 21

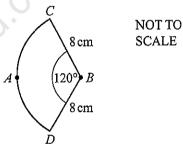
Two circles, centres A and B, are each of radius 8 cm and intersect at C and D. Each circle passes through the centre of the other circle.

(a) Explain why angle CBD is 120°.

Answer(a)

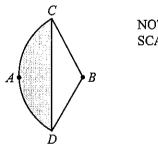
[1]

(b) For the circle, centre B, and the area of the sector BCD.



Answer(b) cm² [2]

(c) (i) Find the area of the shaded segment CAD.

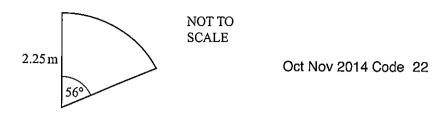


NOT TO **SCALE**

Answer(c)(i) cm² [3]

(ii) Find the area of overlap of the two circles.

Answer(c)(ii) cm² [1]



The diagram shows a sand pit in a child's play area.

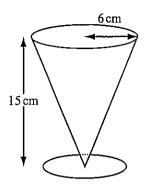
The shape of the sand pit is a sector of a circle of radius 2,25 m and sector angle 56°.

(a) Calculate the area of the sand pit.

Answer(a)		m^2	[2]
22/10/10/ (4)	***************************************	111	L-1

(b) The sand pit is lled with sand to a depth of 0.3 m.

Calculate the volume of sand in the sand pit.



NOT TO **SCALE**

Oct Nov 2014 Code 23

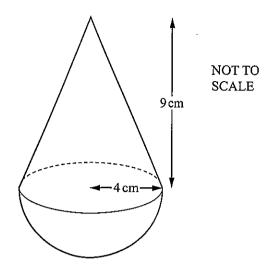
The diagram shows a glass, in the shape of a cone, for drinking milk. The cone has a radius of 6 cm and height 15 cm. A bottle of milk holds 2 litres.

(a) How many times can the glass be completely lled from the bottle? [The volume, V, of a cone with radius r and height h is $V = \frac{1}{3}\pi r^2 h$.]

Answer(a) [4]

(b) Calculate the volume of milk left in the bottle. Give your answer in cm³.

Answer(b) cm³ [3]



May June 2015 Code 21

The diagram shows a toy.

The shape of the toy is a cone, with radius 4 cm and height 9 cm, on top of a hemisphere with radius 4 cm.

Calculate the volume of the toy.

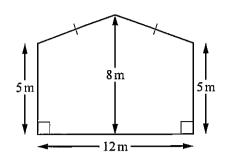
Give your answer correct to the nearest cubic centimetre.

[The volume, V, of a cone with radius r and height h is $V = \frac{1}{3}\pi r^2 h$.]

[The volume, V, of a sphere with radius r is $V = \frac{4}{3}\pi r^3$.]

Answer cm³ [4]

May June 2015 Code 22



NOT TO SCALE

The diagram shows the front face of a barn.

The width of the barn is 12 m.

The height of the barn is 8 m.

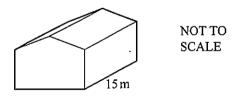
The sides of the barn are both of height 5 m.

(a) Work out the area of the front face of the barn.



(b) The length of the barn is 15 m.

Work out the volume of the barn.

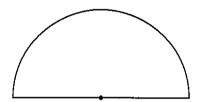


- 22 The circumference of a circle is 30 cm.
 - (a) Calculate the radius of the circle.

May June 2015 Code 23

Answer(a) cm [2]

(b)



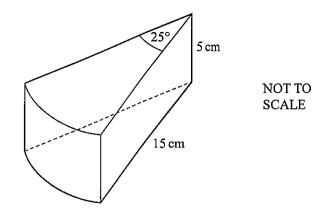
The length of the arc of the semi-circle is 15 cm.

Calculate the area of the semi-circle.

Answer(b) cm² [2]

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23



The diagram shows a wooden prism of height 5 cm.

The cross section of the prism is a sector of a circle with sector angle 25°.

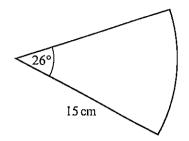
The radius of the sector is 15 cm.

Calculate the total surface area of the prism.

Answer	***************************************	cm ²	[5]
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24



NOT TO SCALE

The diagram shows a sector of a circle with radius 15 cm.

Calculate the perimeter of this sector.

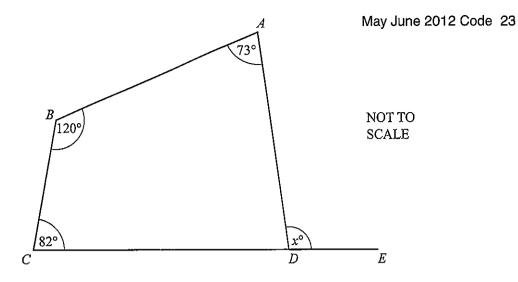
Answer cm [3]

GCSE - Cambridge MATHEMA		TICS - P2		Ch4 - Ged	ometry	
1		TRIGON	OMETRY			
	From the above w	ord, write down the letters whic	h have			
(a) exactly two lines		ines of symmetry,	nmetry, May Ju		une 2012 Code 22	
			Answer(a)		••••••	[1]
	(b) rotational syr	nmetry of order 2.				
			Answer(b)			[1]
2	A car company se	ells a scale model $\frac{1}{10}$ of the size	e of one of its cars.	en e		er organicy
	Complete the following table. May June 2012		e 2012 Cod	e 22		
			Scale Model	Real Car		
		Area of windscreen (cm ²)	135			

Volume of storage space (cm³)

[3]

408 000



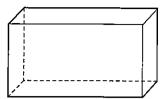
The diagram shows a quadrilateral *ABCD*. *CDE* is a straight line.

Calculate the value of x.

$$Answer x = [2]$$

(a) The diagram shows a cuboid.

Oct Nov 2012 Code 21



How many planes of symmetry does this cuboid have?

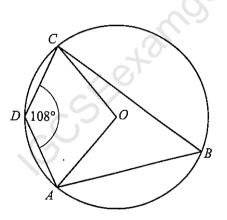
Answer(a) [1]

(b) Write down the order of rotational symmetry for the following diagram.



Answer(b) [1]

5



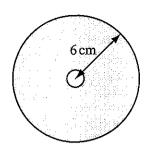
Oct Nov 2012 Code 21

NOT TO **SCALE**

A, B, C and D lie on a circle centre O. Angle $ADC = 108^{\circ}$.

Work out the obtuse angle AOC.

Answer Angle AOC = [2]



NOT TO SCALE

Oct Nov 2012 Code 21

The diagram shows a circular disc with radius 6 cm. In the centre of the disc there is a circular hole with radius 0.5 cm.

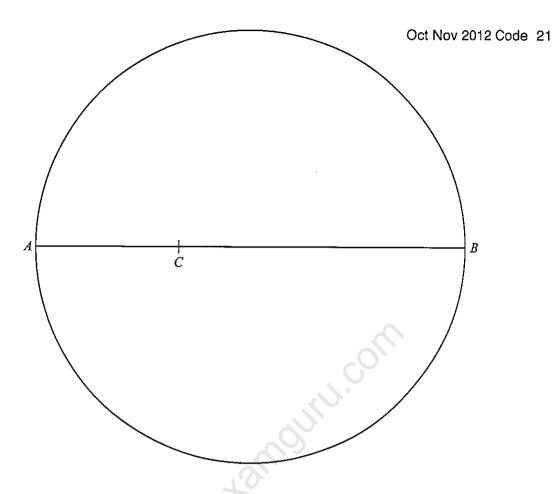
Calculate the area of the shaded section.

Answer cm² [3]

[2]

[1]

7



AB is the diameter of a circle. C is a point on AB such that AC = 4 cm.

(a) Using a straight edge and compasses only, construct

(i) the locus of points which are equidistant from A and from B,

(ii) the locus of points which are 4cm from C.

(b) Shade the region in the diagram which is

nearer to B than to A

and

• less than 4 cm from C.

The diagram shows two of the exterior angles of a regular polygon with n sides. Calculate n.

Answer n = [2]

9



Oct Nov 2012 Code 22

A company sells cereals in boxes which measure $10\,\mathrm{cm}$ by $25\,\mathrm{cm}$ by $35\,\mathrm{cm}$.

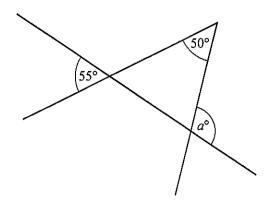
They make a special edition box which is mathematically similar to the original box.

The volume of the special edition box is 15 120 cm³.

Work out the dimensions of this box.

Answer cm by cm by cm [3]

IGC	SE - Cambridge	MATHEMATICS - P2	Ch4 - Geometry
10			Oct Nov 2012 Code 23
		\times^R	
		$_{T}^{ imes}$	
	Using a straight e R and from T.	dge and compasses only, construct the locus o	f points which are equidistant from [2]
	A 11 C 1	THE PROPERTY OF THE PROPERTY O	one menonem experience of the control of the contro
11	The surface area of	s made to a scale of 1:200. The model is 7500 cm ² .	Oct Nov 2012 Code 23
	Calculate the surface	ce area of the ship, giving your answer in square	e metres.
		Answer	m ² [3]



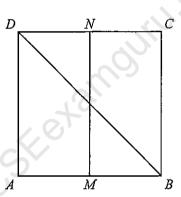
May June 2013 Code 21

NOT TO SCALE

Use the information in the diagram to α nd the value of α .

		ra*
Answer $a =$	the state of the s	171
I I I I I I I I I I I I I I I I I I I	***************	_

13



May June 2013 Code 21

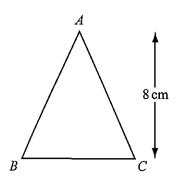
The diagram shows a square ABCD. M is the midpoint of AB and N is the midpoint of CD.

(a) Complete the statement.

The line MN is the locus of points inside the square which are

(b) Shade the region inside the square containing points which are nearer to AB than to BC and nearer to A than to B.

[1]



NOT TO **SCALE**

May June 2013 Code 22

Triangle ABC has a height of 8 cm and an area of 42 cm.

Calculate the length of BC.

Answer $BC = \dots$ cm [2]

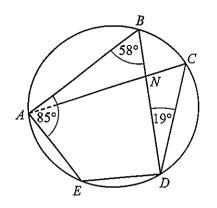
A car, 4.4 metres long, has a fuel tank which holds 65 litres of fuel when full.

The fuel tank of a mathematically similar model of the car holds 0.05 litres of fuel when full.

Calculate the length of the model car in centimetres.

May June 2013 Code 22

Answer cm [3]



May June 2013 Code 22

NOT TO SCALE

A, B, C, D and E are points on a circle. Angle $ABD = 58^{\circ}$, angle $BAE = 85^{\circ}$ and angle $BDC = 19^{\circ}$. BD and CA intersect at N.

Calculate

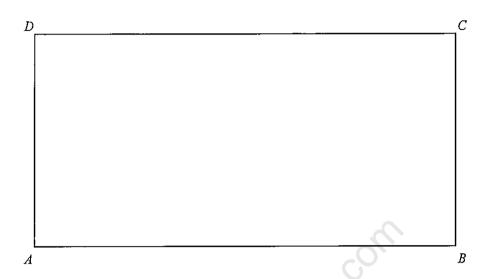
(a) angle BDE,

Answer(a) Angle
$$BDE = \dots [1]$$

(b) angle AND.

$$Answer(b) \text{ Angle } AND = \dots$$
 [2]

May June 2013 Code 22



Scale: 1 cm to 8 m

The rectangle ABCD is a scale drawing of a rectangular football pitch. The scale used is 1 centimetre to represent 8 metres.

- (a) Construct the locus of points 40 m from A and inside the rectangle. [2]
- (b) Using a straight edge and compasses only, construct the perpendicular bisector of DB. [2]
- (c) Shade the region on the football pitch which is more than $40 \,\mathrm{m}$ from A and nearer to D than to B.

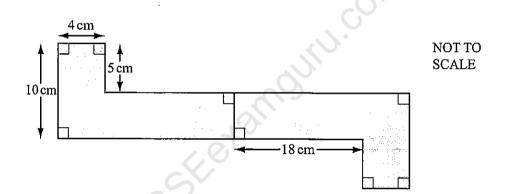
The volumes of two similar cones are $36\pi \,\mathrm{cm}^3$ and $288\pi \,\mathrm{cm}^3$. The base radius of the smaller cone is $3 \,\mathrm{cm}$.

May June 2013 Code 23

Calculate the base radius of the larger cone.

Answer cm [3]

19

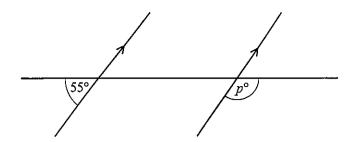


The shaded shape has rotational symmetry of order 2.

May June 2013 Code 23

Work out the shaded area.

Answer cm² [3]



NOT TO SCALE

Oct Nov 2013 Code 21

Find the value of p.

$$Answer p = \dots [2]$$

The volume of a child's model plane is 1200 cm³.

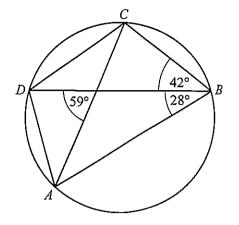
The volume of the full size plane is 4050 m³.

Oct Nov 2013 Code 21

Find the scale of the model in the form 1:n.

A	1 .	Γ2	П
Answer -	1.	 13	- 1

Oct Nov 2013 Code 21



A, B, C and D lie on the circle.

Find

(a) angle ADC,

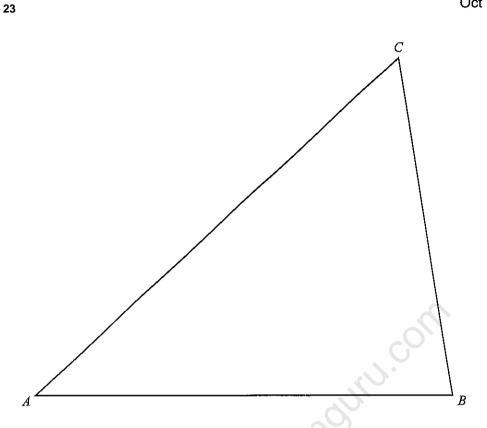
Answer(a) Angle $ADC = \dots [1]$

NOT TO SCALE

(b) angle ADB.

Answer(b) Angle ADB = [2]

Oct Nov 2013 Code 21



(a) In this part, use a straight edge and compasses only and show your construction arcs.

Construct accurately

- the bisector of angle B, [2]
- the locus of points equidistant from B and from C. [2]
- (b) Shade the region inside triangle ABC containing the points which are
 - nearer to BC than to BA and nearer to C than to B. [1]

[1]

(b) Add two lines to the diagram so that it has rotational symmetry of order 2.



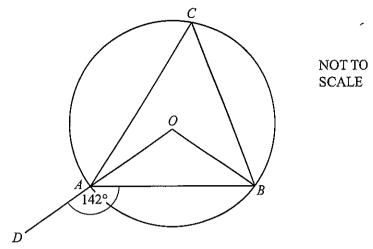
[1]

The exterior angle of a regular polygon is 36°.

Oct Nov 2013 Code 22

What is the name of this polygon?

aswer[3]



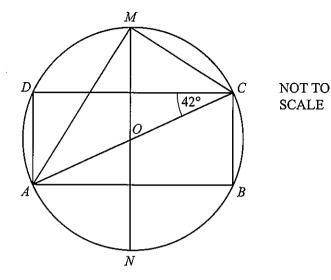
A, B and C are points on the circumference of a circle centre O. OAD is a straight line and angle $DAB = 142^{\circ}$.

Calculate the size of angle ACB.

Oct Nov 2013 Code 22

Answer Angle $ACB = \dots [3]$

Oct Nov 2013 Code 22



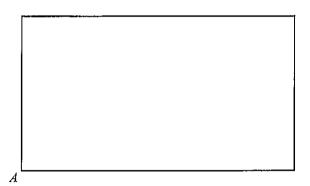
The vertices of the rectangle ABCD lie on a circle centre O. MN is a line of symmetry of the rectangle. AC is a diameter of the circle and angle $ACD = 42^{\circ}$.

Calculate

(a) angle CAM,

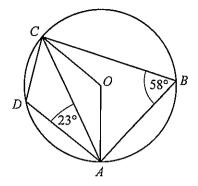
(b) angle DCM.

Oct Nov 2013 Code 22



- (a) Construct the locus of all the points which are 3 cm from vertex A and outside the rectangle. [2]
- (b) Construct, using a straight edge and compasses only, one of the lines of symmetry of the rectangle. [2]

May June 2014 Code 21



A, B, C and D lie on a circle centre O. Angle $ABC = 58^{\circ}$ and angle $CAD = 23^{\circ}$.

Calculate

(a) angle OCA,

Answer(a) Angle OCA = ...

NOT TO **SCALE**

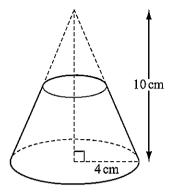
(b) angle DCA.

Answer(b) Angle $DCA = \dots$ [2]

NOT TO SCALE

30

May June 2014 Code 21



A solid cone has base radius 4 cm and height 10 cm.

A mathematically similar cone is removed from the top as shown in the diagram. The volume of the cone that is removed is $\frac{1}{8}$ of the volume of the original cone.

(a) Explain why the cone that is removed has radius 2 cm and height 5 cm.

Answer(a)

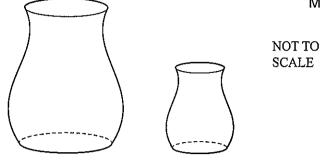
[2]

(b) Calculate the volume of the remaining solid.

[The volume, V, of a cone with radius r and height h is $V = \frac{1}{3}\pi r^2 h$.]

Answer(b) cm³ [4]

May June 2014 Code 22



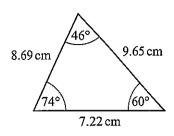
The two containers are mathematically similar in shape.

The larger container has a volume of 3456 cm³ and a surface area of 1024 cm².

The smaller container has a volume of 1458 cm³.

Calculate the surface area of the smaller container.

	in court	
Cosketall	Answer cm ²	[4]



NOT TO **SCALE** 9.65 cm

These two triangles are congruent. Write down the value of

May June 2014 Code 23

(a) x,

(b) y.

33

ZEBRA

Oct Nov 2014 Code 21

Write down the letters in the word above that have

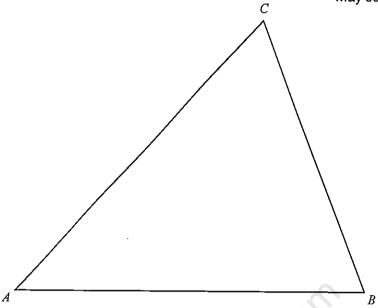
(a) exactly one line of symmetry,

Answer(a) [1]

(b) rotational symmetry of order 2.

Answer(b)[1]

May June 2014 Code 23



- (a) Using compasses and straight edge only, construct
 - (i) the perpendicular bisector of AC,

[2]

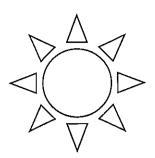
(ii) the bisector of angle ACB.

[2]

- (b) Shade the region inside the triangle which is
 - nearer to A than to C and

• nearer to AC than to BC.

[1]

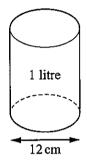


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Write down the order of rotational symmetry of this shape.

4		г	1	٦	
Answer	***************************************	П	Ţ	1	

36





NOT TO SCALE

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Two cylindrical cans are mathematically similar.

The larger can has a capacity of 1 litre and the smaller can has a capacity of 440 ml.

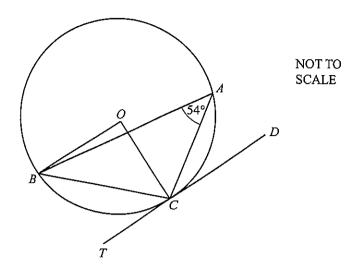
Calculate the diameter, d, of the 440 ml can.

Answer
$$d =$$
 cm [3]

37 A, B and C are points on a circle, centre O. TCD is a tangent to the circle.

Angle $BAC = 54^{\circ}$.

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(a) Find angle BOC, giving a reason for your answer.

Answer(a) Angle BOC = because

- (b) When O is the origin, the position vector of point C is $\begin{pmatrix} 3 \\ -4 \end{pmatrix}$.
 - (i) Work out the gradient of the radius OC.

Answer(b)(i)[1]

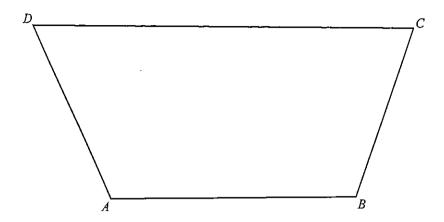
(ii) D is the point (7, k).

Find the value of k.

$$Answer(b)(ii) k = [1]$$

The diagram shows the plan, ABCD, of a park.
The scale is 1 centimetre represents 20 metres.

Oct Nov 2014 Code 22



Scale: 1 cm to 20 m

(a) Find the actual distance BC.

Answer(a) m [2]

- (b) A fountain, F, is to be placed
 - 160 m from C

and

equidistant from AB and AD.

On the diagram, using a ruler and compasses only, construct and mark the position of F. Leave in all your construction lines.

[5]

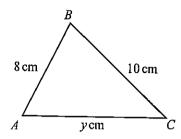
Answer [3]

Oct Nov 2014 Code 23

Oct Nov 2014 Code 23

- (a) Draw the locus of the points which are 3 cm from E. [1]
- (b) Using a straight edge and compasses only, construct the bisector of angle DCB. [2]
- (c) Shade the region which is
 - less than 3 cm from E and

nearer to CB than to CD. [1]



6 cm x cm

NOT TO SCALE

Triangle ABC is similar to triangle DEF.

Calculate the value of

(a) x,

May June 2015 Code 21

 $Answer(a) x = \dots [2]$

(b) y.

 $Answer(b) y = \dots [2]$

43 The diagram shows the positions of three points A, B and C.

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 C_{ullet}

A •

(a) Draw the locus of points which are 4 cm from C.

[1]

(b) Using a straight edge and compasses only, construct the locus of points which are equidistant from A and B.

[2]

(c) Shade the region which is

• less than 4 cm from C

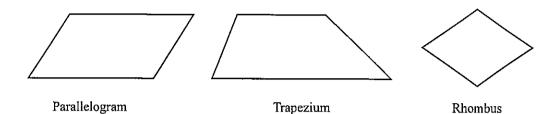
and

nearer to B than to A.

[1]

0580/22/O/N/15

44



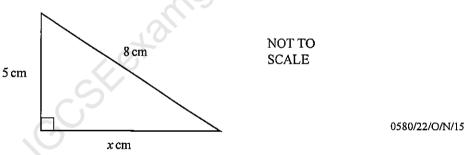
Write down which one of these shapes has

Parallelogram

- rotational symmetry of order 2
- and
 - · no line symmetry.

Answer[1	1
	-	

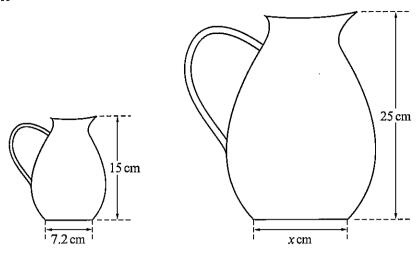
45



Calculate the value of x.

0580/22/O/N/15

(a)



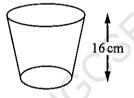
NOT TO **SCALE**

The diagram shows two jugs that are mathematically similar.

Find the value of x.

 $Answer(a) x = \dots [2]$

(b)



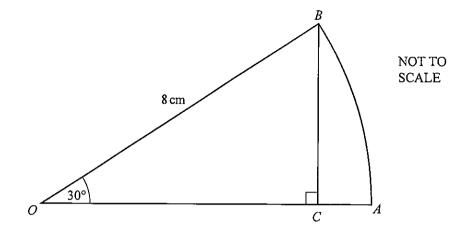
NOT TO **SCALE**

The diagram shows two glasses that are mathematically similar. The height of the larger glass is 16 cm and its volume is 375 cm³. The height of the smaller glass is y cm and its volume is 192 cm^3 .

Find the value of y.

0580/23/O/N/15

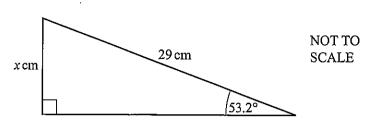
47



OAB is the sector of a circle, centre O, with radius 8 cm and sector angle 30°. BC is perpendicular to OA.

Calculate the area of the region shaded on the diagram.

Answer	••••••	cm ²	[5	1
21710 77 07		CIII	L٧	

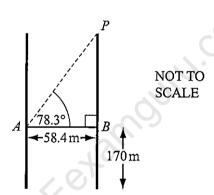


Calculate the value of x.

May June 2012 Code 21

Answer $x =$	******************************	[2]
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2

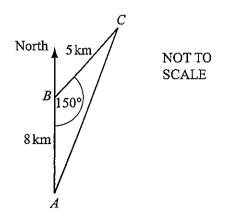


May June 2012 Code 21

The line AB represents the glass walkway between the Petronas Towers in Kuala Lumpur. The walkway is 58.4 metres long and is 170 metres above the ground. The angle of elevation of the point P from A is 78.3°.

Calculate the height of P above the ground.

Answer	*******************************	m	[3]



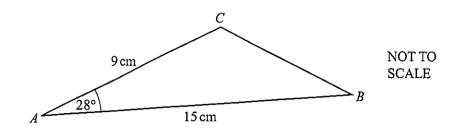
May June 2012 Code 21

A helicopter flies 8 km due north from A to B. It then flies 5 km from B to C and returns to A. Angle $ABC = 150^{\circ}$.

(a) Calculate the area of triangle ABC.

Answer(a)	434111411111111111111111111111111111111	km^2	[2]

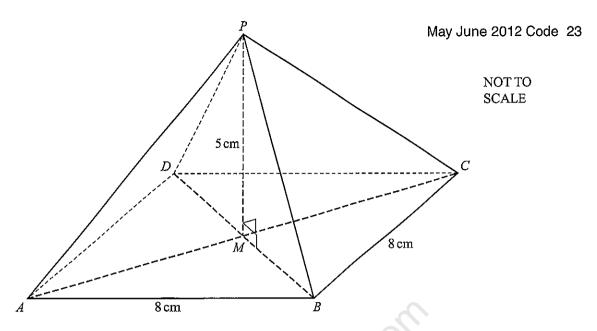
(b) Find the bearing of B from C.



Calculate the area of triangle ABC.

Answer		cm^2	[2]
			L-1

May June 2012 Code 23



The diagram shows a pyramid on a square base ABCD. The diagonals of the base, AC and BD, intersect at M.

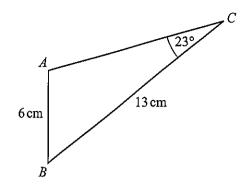
The sides of the square are 8 cm and the vertical height of the pyramid, PM, is 5 cm.

Calculate

(a) the length of the edge PB,

(b) the angle between PB and the base ABCD.

Answer(b) [3]

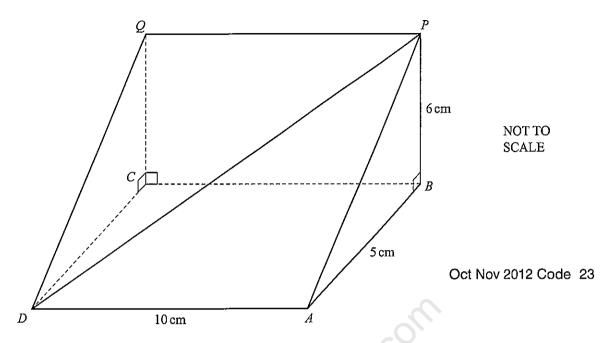


Oct Nov 2012 Code 23

NOT TO **SCALE**

In triangle ABC, AB = 6 cm, BC = 13 cm and angle $ACB = 23^{\circ}$. Calculate angle BAC, which is obtuse.

> Answer Angle BAC = [4]



The diagram shows a triangular prism. ABCD is a horizontal rectangle with $DA = 10 \,\mathrm{cm}$ and $AB = 5 \,\mathrm{cm}$. BCQP is a vertical rectangle and $BP = 6 \,\mathrm{cm}$.

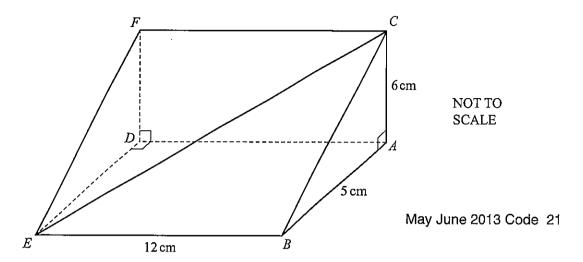
Calculate

(a) the length of DP,

Answer(a) DP =	cm	[3]
arm wer tur 121	VIII	

(b) the angle between DP and the horizontal rectangle ABCD.

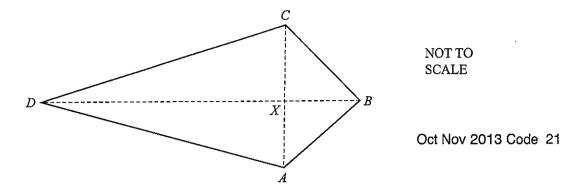
Answer(b)[3]



The diagram shows a triangular prism of length 12 cm. Triangle ABC is a cross section of the prism. Angle $BAC = 90^{\circ}$, AC = 6 cm and AB = 5 cm.

Calculate the angle between the line CE and the base ABED.

Answer [4]

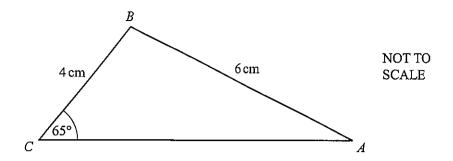


ABCD is a kite. The diagonals AC and BD intersect at X. AC = 12 cm, BD = 20 cm and DX:XB = 3:2.

(a) Calculate angle ABC.

$$Answer(a) \text{ Angle } ABC = \dots [3]$$

(b) Calculate the area of the kite.



In triangle ABC, AB = 6 cm, BC = 4 cm and angle $BCA = 65^{\circ}$.

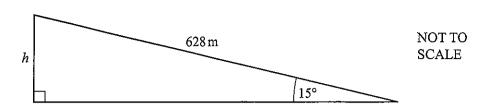
Calculate

Oct Nov 2013 Code 22

(a) angle CAB,

Answer(a) Angle
$$CAB = \dots$$
 [3]

(b) the area of triangle ABC.



Calculate the length h. Give your answer correct to 2 signi cant gures.

Oct Nov 2013 Code 23

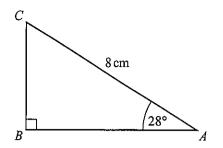
Answer h =	•••••	m	[3
------------	-------	---	----

A triangle has sides of length 2 cm, 8 cm and 9 cm.

May June 2014 Code 21

Calculate the value of the largest angle in this triangle.

nswer	[4]
uswei	 171

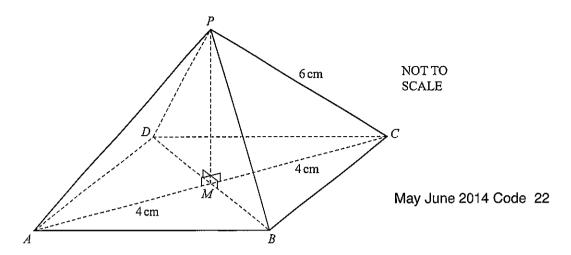


May June 2014 Code 22

NOT TO SCALE

Calculate the length of AB.

Answer AB = cm [2]

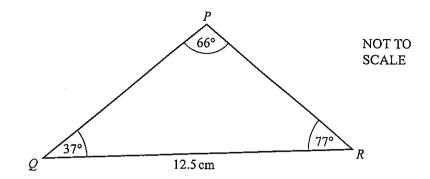


The diagram shows a pyramid on a square base ABCD with diagonals, AC and BD, of length 8 cm. AC and BD meet at M and the vertex, P, of the pyramid is vertically above M. The sloping edges of the pyramid are of length 6 cm.

Calculate

(a) the perpendicular height, PM, of the pyramid,

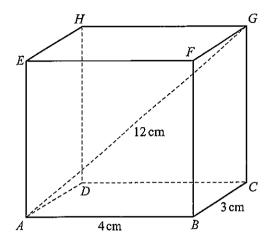
(b) the angle between a sloping edge and the base of the pyramid.



Calculate PR.

May June 2014 Code 23

Answer $PR = \dots$ cm [3]



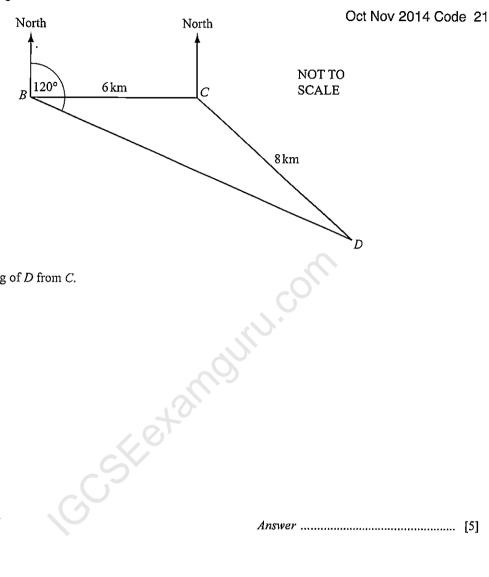
NOT TO SCALE

ABCDEFGH is a cuboid. AB = 4 cm, BC = 3 cm and AG = 12 cm. May June 2014 Code 23

Calculate the angle that AG makes with the base ABCD.

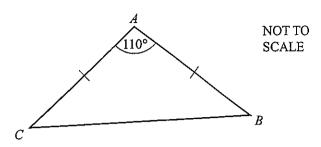
Answer [4]

17 A helicopter ies from its base B to deliver supplies to two oil rigs at C and D. C is 6 km due east of B and the distance from C to D is 8 km. D is on a bearing of 120° from B.



Find the bearing of D from C.

Answer [5]

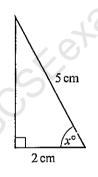


Triangle ABC is isosceles with AB = AC. Angle $BAC = 110^{\circ}$ and the area of the triangle is 85 cm^2 . Oct Nov 2014 Code 22

Calculate AC.

Answer AC =	.,,,,,,,,,	cm	[3]
-------------	------------	----	-----

19

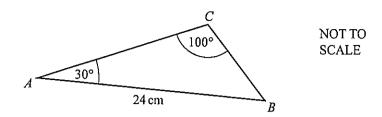


NOT TO SCALE

Oct Nov 2014 Code 23

Calculate the value of x.

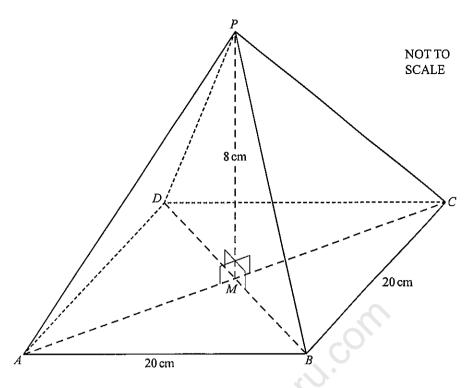
 $Answer x = \dots [2]$



Use the sine rule to calculate BC.

May June 2015 Code 23

Answer $BC = \dots$ cm [3]



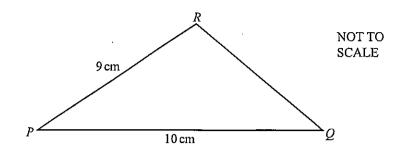
The diagram shows a solid pyramid on a square horizontal base ABCD. The diagonals AC and BD intersect at M.

P is vertically above M. AB = 20 cm and PM = 8 cm.

May June 2015 Code 23

Calculate the total surface area of the pyramid.

Answer cm² [5]



Collin Co

The area of triangle PQR is $38.5 \, \text{cm}^2$.

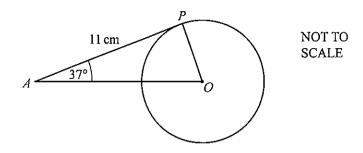
Calculate the length QR.

May June 2015 Code 23

Answer
$$QR = \dots$$
 cm [6]

0580/21/O/N/15

23



In the diagram, AP is a tangent to the circle at P. O is the centre of the circle, angle $PAO = 37^{\circ}$ and AP = 11 cm.

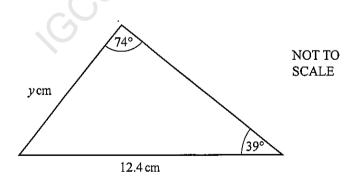
(a) Write down the size of angle OPA.

(b) Work out the radius of the circle.

Answer(b) cm [2]

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24



Calculate the value of y.

 $Answer y = \dots [3]$

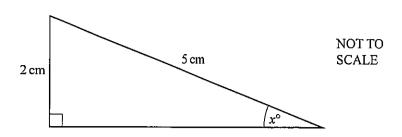
IGCSE - Cambridge

MATHEMATICS - P2

Ch 5 - Trigonometry

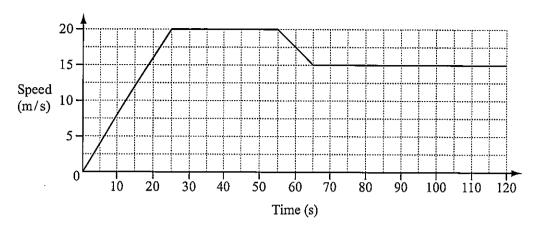
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25



Calculate the value of x.

 $Answer x = \dots [2]$



The diagram shows the speed-time graph for the first 120 seconds of a car journey.

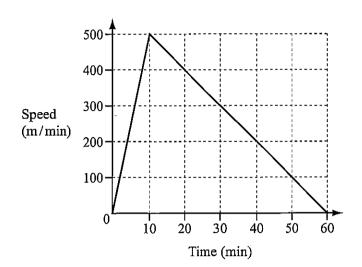
(a) Calculate the acceleration of the car during the first 25 seconds.

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Answer(a) m/s^2 [1]

(b) Calculate the distance travelled by the car in the first 120 seconds.

Answer(b) m [4]



The diagram shows the speed-time graph for a boat journey.

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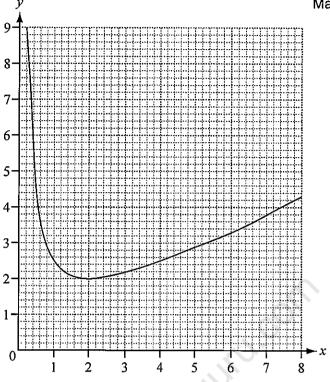
(a) Work out the acceleration of the boat in metres/minute².

Answer(a)		m/min^2	Г17	
ZITES TYCH (U)	(*******************	TIL, IIIIII	L^_1	

(b) Calculate the total distance travelled by the boat. Give your answer in kilometres.

..... km [2]





The diagram shows the graph of $y = \frac{x}{2} + \frac{2}{x}$, for $0 < x \le 8$.

(a) Use the graph to solve the equation $\frac{x}{2} + \frac{2}{x} = 3$.

Answer (a)
$$x =$$
 or $x =$ [2]

(b) By drawing a suitable tangent, work out an estimate of the gradient of the graph where x = 1.

Answer(b) [3]

4 (a) Find the co-ordinates of the midpoint of the line joining A(-8, 3) and B(-2, -3).

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Answer(a) (______ , _____) [2]

(b) The line y = 4x + c passes through (2, 6).

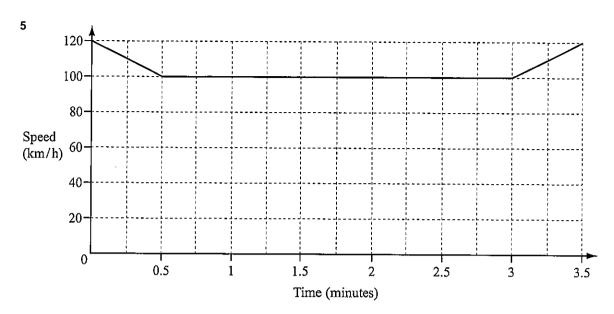
Find the value of c.

Answer(b) c = [1]

(c) The lines 5x = 4y + 10 and 2y = kx - 4 are parallel.

Find the value of k.

Answer(c) k = [2]

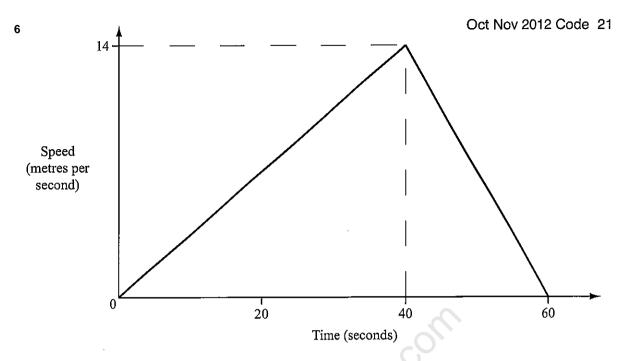


The diagram shows the speed-time graph for part of a car journey. The speed of the car is shown in kilometres/hour.

Calculate the distance travelled by the car during the 3.5 minutes shown in the diagram. Give your answer in kilometres.

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Answer km [4]



The diagram shows the speed-time graph of a bus journey between two bus stops.

Hamid runs at a constant speed of 4 m/s along the bus route.

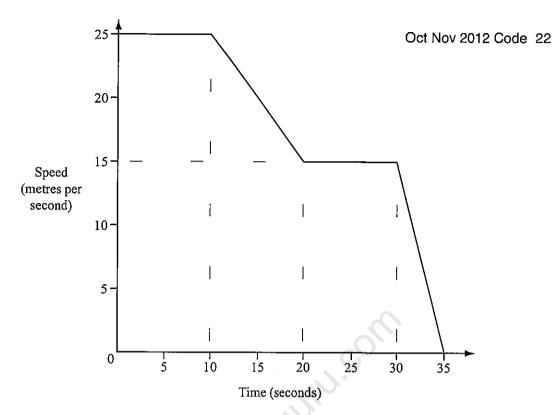
He passes the bus as it leaves the first bus stop.

The bus arrives at the second bus stop after 60 seconds.

How many metres from the bus is Hamid at this time?

Amound	•	123	121
Answer		111	[-]

7



The diagram shows the speed-time graph for the last 35 seconds of a car journey.

(a) Find the deceleration of the car as it came to a stop.

Answer(a) _____ m/s² [1]

(b) Calculate the total distance travelled by the car in the 35 seconds.

Answer(b) ______ m [3]

8 (a) The two lines y = 2x + 8 and y = 2x - 12 intersect the x-axis at P and Q.

Work out the distance PQ.

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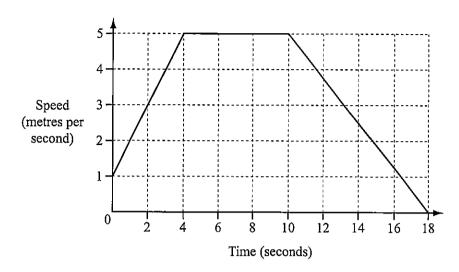
Answer(a) PQ = [2]

(b) Write down the equation of the line with gradient -4 passing through (0, 5).

Answer(b) [2]

(c) Find the equation of the line parallel to the line in part (b) passing through (5, 4).

Answer(c) [3]



The diagram shows the speed-time graph for the last 18 seconds of Roman's cycle journey.

(a) Calculate the deceleration.

Answer(a)		m/s ²	[1]
1.7	************************		L-1

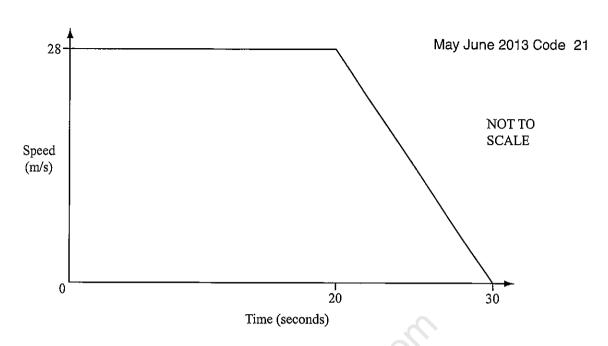
(b) Calculate the total distance Roman travels during the 18 seconds.

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Answer(b) m [3]

Find the equation of the line passing through the points (0, -1) and (3, 5).

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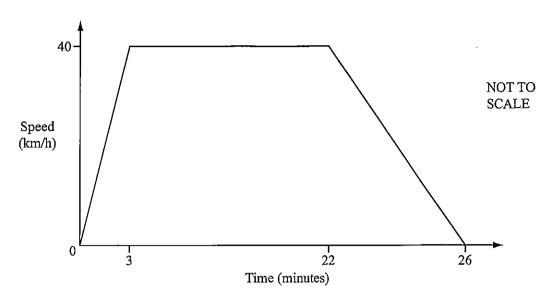
The diagram shows the speed-time graph of a car.

It travels at 28 m/s for 20 seconds and then decelerates until it stops after a further 10 seconds.

(a) Calculate the deceleration of the car.

4 ()	
<i>Answer(a)</i> m/s ²	F17

(b) Calculate the distance travelled during the 30 seconds.



The diagram shows the speed-time graph of a train journey between two stations.

The train accelerates for 3 minutes, travels at a constant maximum speed of 40 km/h, then takes 4 minutes to slow to a stop.

Calculate the distance in kilometres between the two stations.

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Answer km [4]

13 A(5, 23) and B(-2, 2) are two points.

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(a) Find the co-ordinates of the midpoint of the line AB.

Answer(a) (.....,) [2]

(b) Find the equation of the line AB.

Answer(b)[3]

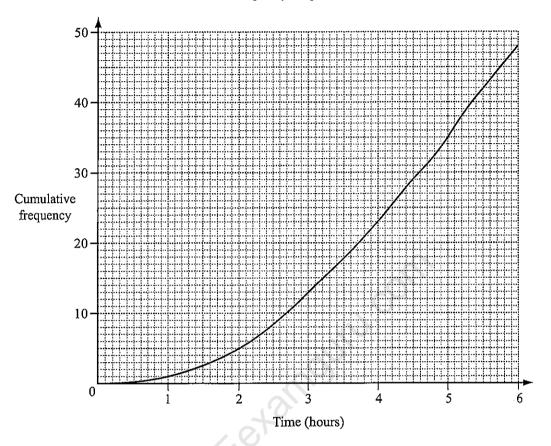
(c) Show that the point (3, 17) lies on the line AB.

Answer(c)

[1]

14 During one day 48 people visited a museum. The length of time each person spent in the museum was recorded. The results are shown on the cumulative frequency diagram.

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Work out

(a) the median,

Answer(a) h [1]

(b) the 20th percentile,

Answer(b) h [2]

(c) the inter-quartile range,

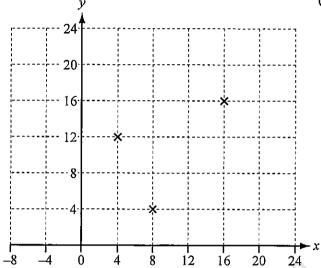
Answer(c) h [2]

(d) the probability that a person chosen at random spends 2 hours or less in the museum.

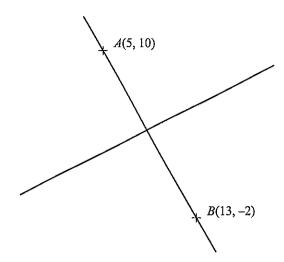
Answer(d) [2]

15 Three of the vertices of a parallelogram are at (4, 12), (8, 4) and (16, 16).

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Write down the co-ordinates of two possible positions of the fourth vertex.



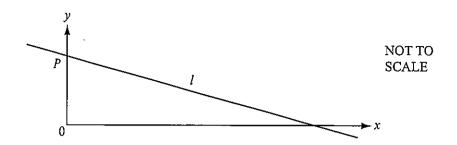
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A(5, 10) and B(13, -2) are two points on the line AB. GCSF.eXamouni.com The perpendicular bisector of the line AB has gradient $\frac{2}{3}$.

Find the equation of the perpendicular bisector of AB.

Answer [4]



The equation of the line l in the diagram is y = 5 - x.

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(a) The line cuts the y-axis at P.

Write down the co-ordinates of P.

(b) Write down the gradient of the line l.

Answer(b)[1]

Find the equation of the line passing through the points with co-ordinates (5, 9) and (-3, 13).

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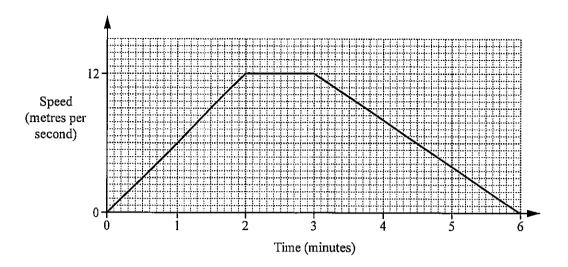
Answer [3]

The point A has co-ordinates (-4, 6) and the point B has co-ordinates (7, -2).

Calculate the length of the line AB.

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Answer AB = units [3]



A tram leaves a station and accelerates for 2 minutes until it reaches a speed of 12 metres per second. It continues at this speed for 1 minute.

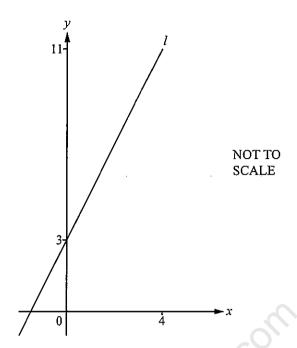
It then decelerates for 3 minutes until it stops at the next station.

The diagram shows the speed-time graph for this journey.

Calculate the distance, in metres, between the two stations.

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Answer m [3]



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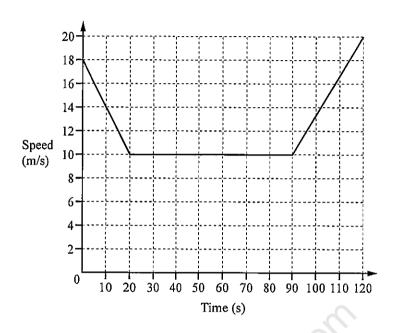
The diagram shows the straight line, l, which passes through the points (0, 3) and (4, 11).

(a) Find the equation of line l in the form y = mx + c.

(b) Line p is perpendicular to line l.

Write down the gradient of line p.

Answer(b)[1]



The diagram shows the speed-time graph for 120 seconds of a car journey.

(a) Calculate the deceleration of the car during the first 20 seconds.

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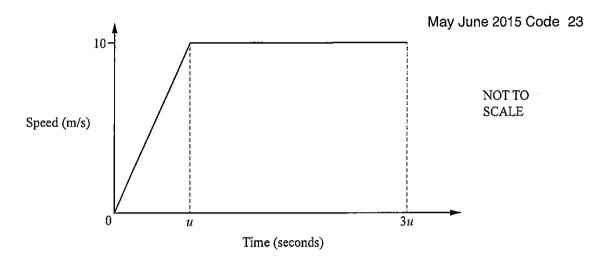
Answer(a) m/s² [1]

(b) Calculate the total distance travelled by the car during the 120 seconds.

Answer(b) m [3]

(c) Calculate the average speed for this 120 second journey.

Answer(c) m/s [1]



A car starts from rest and accelerates for u seconds until it reaches a speed of 10 m/s. The car then travels at 10 m/s for 2u seconds.

The diagram shows the speed-time graph for this journey.

The distance travelled by the car in the first 3u seconds is $125 \,\mathrm{m}$.

(a) Find the value of u.

(b) Find the acceleration in the first u seconds.

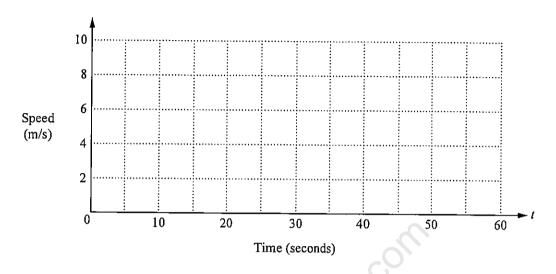
[2]

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A car passes through a checkpoint at time t = 0 seconds, travelling at 8 m/s. It travels at this speed for 10 seconds.

The car then decelerates at a constant rate until it stops when t = 55 seconds.

(a) On the grid, draw the speed-time graph.



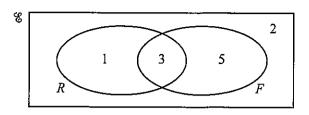
(b) Calculate the total distance travelled by the car after passing through the checkpoint.

Answer(b) m [3]

0580/21/M/J/16

25 A is the point (4, 1) and B is the point (10, 15).

Find the equation of the perpendicular bisector of the line AB.



11 students are asked if they like rugby (R) and if they like football (F). The Venn diagram shows the results.

(a) A student is chosen at random.

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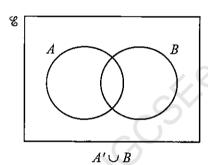
What is the probability that the student likes rugby and football?

Annuarial		г.	1	-
Answer (u)	***************************************	1.	Ŧ	

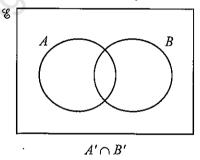
(b) On the Venn diagram shade the region $R' \cap F'$.

[1]

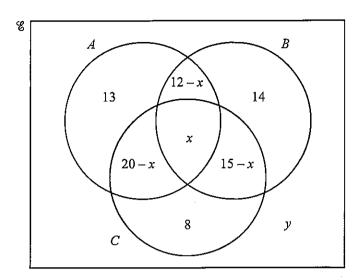
2 Shade the required region on each Venn diagram.



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[2]



The Venn diagram shows the number of elements in sets A, B and C.

(a) $n(A \cup B \cup C) = 74$

May June 2013 Code 23

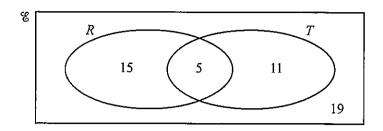
Find x.

(b) $n(\mathscr{C}) = 100$

Find y.

(c) Find the value of $n((A \cup B)' \cap C)$.

Answer(c)[1]



The Venn diagram shows the number of red cars and the number of two-door cars in a car park. There is a total of 50 cars in the car park. $R = \{\text{red cars}\}\$ and $T = \{\text{two-door cars}\}\$.

(a	ú	Α	car	is	chosen	at	random.
3		.,		~~~		OLLODOLL	u	I CLIACONIA.

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Write down the probability that

(i) it is red and it is a two-door car,

(ii) it is not red and it is a two-door car.

(b) A two-door car is chosen at random.

Write down the probability that it is not red.

(c) Two cars are chosen at random.

Find the probability that they are both red.

(d) On the Venn diagram, shade the region $R \cup T'$.

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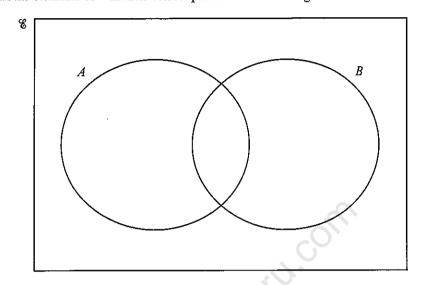
5

 $\mathscr{C} = \{x : 1 \le x \le 10, \text{ where } x \text{ is an integer}\}\$

 $A = \{\text{square numbers}\}\$

 $B = \{1, 2, 3, 4, 5, 6\}$

(a) Write all the elements of & in their correct place in the Venn diagram.



[2]

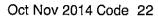
(b) List the elements of $(A \cup B)'$.

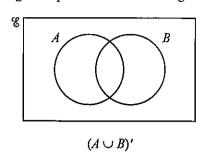
Answer(b) [1]

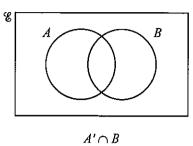
(c) Find $n(A \cap B')$.

Answer(c)[1]

6 Shade the region required in each Venn diagram.







[2]

7 The lights and brakes of 30 bicycles are tested. The table shows the results.

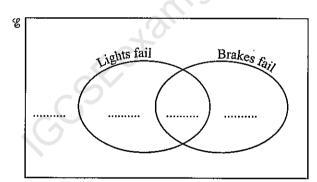
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	Lights	Brakes
Fail test	3	9
Pass test	27	21

The lights and brakes both failed on one bicycle only.

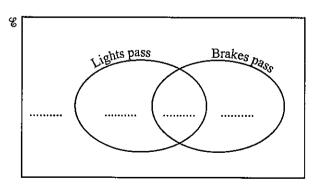
& = {30 bicycles}
Complete the Venn diagrams.

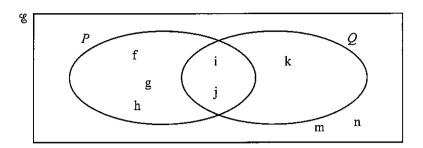
(a)



[2]

(b)





(a) Use the information in the Venn diagram to complete the following.

(i)
$$P \cap Q = \{\dots\}$$

(ii)
$$P' \cup Q = \{\dots \}$$

(iii)
$$n(P \cup Q)' = \dots$$
 [1]

(b) A letter is chosen at random from the set Q.

Find the probability that it is also in the set P.

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(c) On the Venn diagram shade the region $P' \cap Q$.

[1]

(d) Use a set notation symbol to complete the statement.

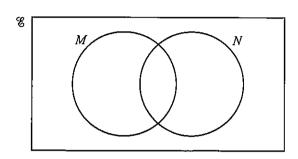
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9 (a) You may use this Venn diagram to help you answer part (a).

 $\mathscr{E} = \{x : 1 \le x \le 12, x \text{ is an integer}\}\$

 $M = \{ \text{odd numbers} \}$

 $N = \{\text{multiples of 3}\}\$



(i) Find n(N).

Answer(a)(i)	[]	1	1
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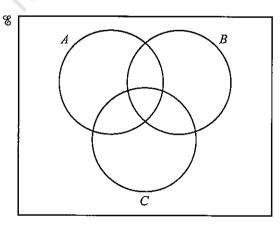
(ii) Write down the set $M \cap N$.

$$Answer(a)(ii) M \cap N = \{\dots, \} [1]$$

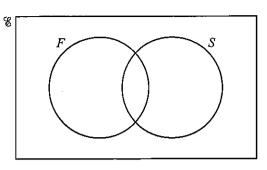
(iii) Write down a set P where $P \subset M$.

Answer(a)(iii)
$$P = \{.....\}$$
 [1]

(b) Shade $(A \cup C) \cap B'$ in the Venn diagram below.



10 (a) In this part, you may use this Venn diagram to help you answer the questions.



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In a class of 30 students, 25 study French (F), 18 study Spanish (S). One student does not study French or Spanish.

(i) Find the number of students who study French and Spanish.

Answer(a)(i)[2]

(ii) One of the 30 students is chosen at random.

Find the probability that this student studies French but not Spanish.

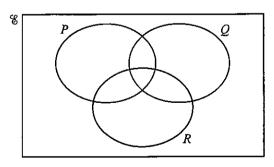
Answer(a)(ii) [1]

(iii) A student who does not study Spanish is chosen at random.

Find the probability that this student studies French.

Answer(a)(iii)[1]

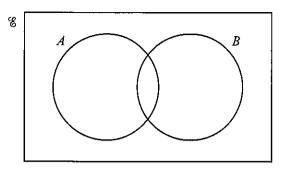
(b)



On this Venn diagram, shade the region $R \cap (P \cup Q)'$.

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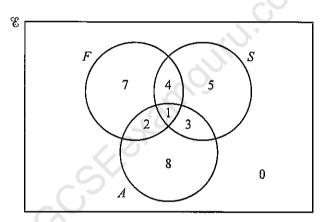


In the Venn diagram shade the region $A \cup B'$.

[1]

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The Venn diagram shows the number of students who study French (F), Spanish (S) and Arabic (A).



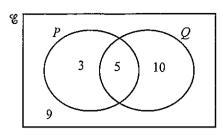
(a) Find $n(A \cup (F \cap S))$.

Answer(a)[1]

(b) On the Venn diagram, shade the region $F' \cap S$.

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13

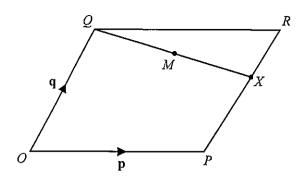


The Venn diagram shows the number of elements in each set.

(a) Find $n(P' \cap Q)$.

Answer(a)[1]

(b) Complete the statement n(.....) = 17.



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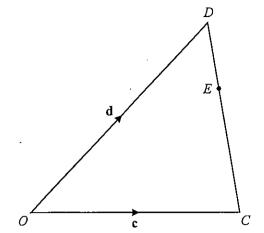
O is the origin and OPRQ is a parallelogram. The position vectors of P and Q are **p** and **q**. X is on PR so that PX = 2XR.

Find, in terms of p and q, in their simplest forms

(a) \overrightarrow{QX} ,

Answer(a)
$$\overrightarrow{QX} =$$
 [2]

(b) the position vector of M, the midpoint of QX.



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NOT TO SCALE

In the diagram, O is the origin.

 $\overrightarrow{OC} = \mathbf{c}$ and $\overrightarrow{OD} = \mathbf{d}$.

E is on CD so that CE = 2ED.

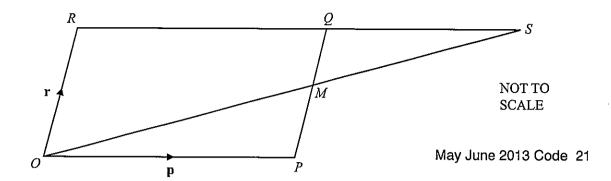
Find, in terms of c and d, in their simplest forms,

(a) \overrightarrow{DE} ,

Answer(a)
$$\overline{DE} =$$
 [2]

(b) the position vector of E.

$$Answer(b)$$
 [2]



OPQR is a parallelogram, with O the origin.

M is the midpoint of PQ.

OM and RQ are extended to meet at S.

$$\overrightarrow{OP} = \mathbf{p}$$
 and $\overrightarrow{OR} = \mathbf{r}$.

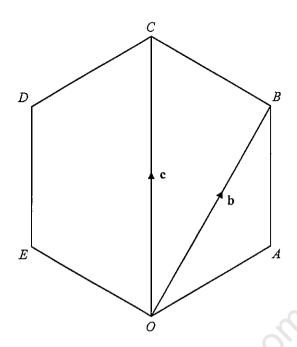
- (a) Find, in terms of p and r, in its simplest form,
 - (i) \overrightarrow{OM} ,

$$Answer(a)(i) \ \overrightarrow{OM} = \dots$$
 [1]

(ii) the position vector of S.

(b) When $\overline{PT} = -\frac{1}{2}\mathbf{p} + \mathbf{r}$, what can you write down about the position of T?

Answer(b)[1]



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OABCDE is a regular polygon.

(a) Write down the geometrical name for this polygon.

(b) O is the origin. $\overrightarrow{OB} = \mathbf{b}$ and $\overrightarrow{OC} = \mathbf{c}$.

Find, in terms of b and c, in their simplest form,

(i) \overrightarrow{BC} ,

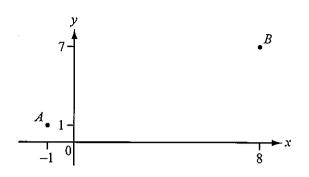
Answer(b)(i)
$$\overrightarrow{BC} = \dots$$
 [1]

(ii) \overrightarrow{OA} ,

Answer(b)(ii)
$$\overrightarrow{OA} = \dots$$
 [2]

(iii) the position vector of E.

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A is the point (-1, 1) and B is the point (8, 7).

- (a) Write \overrightarrow{AB} as a column vector.
- **(b)** Find $|\overrightarrow{AB}|$.

Answer(a)
$$\overrightarrow{AB} = \left(\right)$$
 [1]

Answer(b) $|\overrightarrow{AB}| = \dots$ [2]

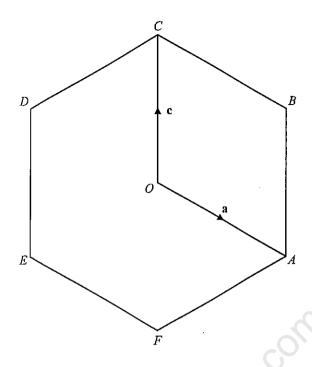
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(c) $\overrightarrow{AC} = 2\overrightarrow{AB}$.

Write down the co-ordinates of C.

Answer(c) (....., 1]

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O is the origin.

ABCDEF is a regular hexagon and O is the midpoint of AD.

$$\overrightarrow{OA} = \mathbf{a}$$
 and $\overrightarrow{OC} = \mathbf{c}$.

Find, in terms of a and c, in their simplest form

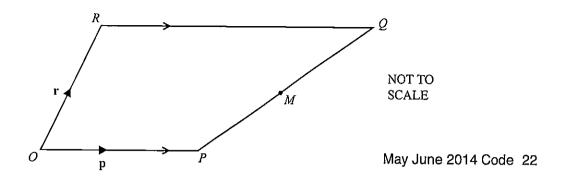
(a) \overrightarrow{BE} ,

Answer(a)
$$\overrightarrow{BE} = \dots$$
 [2]

(b) \overrightarrow{DB} ,

Answer(b)
$$\overrightarrow{DB} = \dots$$
 [2]

(c) the position vector of E.



OPQR is a trapezium with RQ parallel to OP and RQ = 2OP. O is the origin, $\overrightarrow{OP} = \mathbf{p}$ and $\overrightarrow{OR} = \mathbf{r}$. M is the midpoint of PQ.

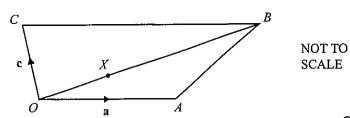
Find, in terms of p and r, in its simplest form

(a) \overrightarrow{PQ} ,

Answer(a) $\overrightarrow{PQ} = \dots$ [1]

(b) \overrightarrow{OM} , the position vector of M.

 $Answer(b) \overrightarrow{OM} = \dots [2]$



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The diagram shows a quadrilateral OABC.

$$\overrightarrow{OA} = \mathbf{a}$$
, $\overrightarrow{OC} = \mathbf{c}$ and $\overrightarrow{CB} = 2\mathbf{a}$.

X is a point on OB such that OX:XB = 1:2.

- (a) Find, in terms of a and c, in its simplest form
 - (i) \overrightarrow{AC} ,

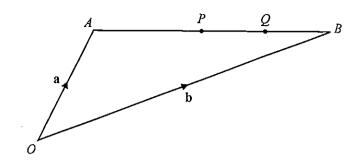
Answer(a)(i)
$$\overrightarrow{AC}$$
 =[1]

(ii) \overrightarrow{AX} .

$$Answer(a)(ii) \overrightarrow{AX} = [3]$$

(b) Explain why the vectors \overrightarrow{AC} and \overrightarrow{AX} show that C, X and A lie on a straight line.

Answer(o)	
	[2]
.,.,	 [4]



NOT TO **SCALE**

Oct Nov 2014 Code 23

The diagram shows two points, P and Q, on a straight line AB. P is the midpoint of AB and Q is the midpoint of PB. O is the origin, $\overrightarrow{OA} = \mathbf{a}$ and $\overrightarrow{OB} = \mathbf{b}$.

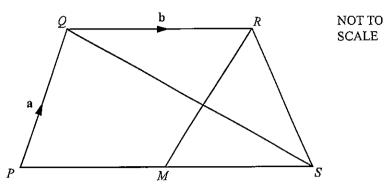
Write down, in terms of a and b, in its simplest form

(a) \overrightarrow{AP} ,

Answer(a)
$$\overrightarrow{AP} = \dots$$
 [2]

(b) the position vector of Q.

Answer(b) [2]



PQRS is a quadrilateral and M is the midpoint of PS.

 $\overrightarrow{PQ} = \mathbf{a}$, $\overrightarrow{QR} = \mathbf{b}$ and $\overrightarrow{SQ} = \mathbf{a} - 2\mathbf{b}$.

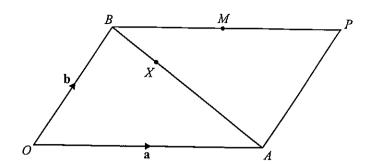
(a) Show that $\overrightarrow{PS} = 2\mathbf{b}$.

Answer(a)

May June 2015 Code 21

[1]

(b) Write down the mathematical name for the quadrilateral PQRM, giving reasons for your answer.



NOT TO SCALE

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OAPB is a parallelogram.

O is the origin, $\overrightarrow{OA} = \mathbf{a}$ and $\overrightarrow{OB} = \mathbf{b}$. M is the midpoint of BP.

- (a) Find, in terms of a and b, giving your answer in its simplest form,
 - (i) \overrightarrow{BA} ,

Answer(a)(i)
$$\overrightarrow{BA} = \dots$$
 [1]

(ii) the position vector of M.

(b) X is on BA so that BX: XA = 1:2.

Show that X lies on OM.

Answer(b)

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12

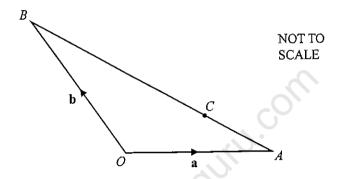
$$\overrightarrow{AB} = \begin{pmatrix} -3 \\ 5 \end{pmatrix}$$

Find $|\overrightarrow{AB}|$.

Answer[2]

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In the diagram, O is the origin, $\overrightarrow{OA} = \mathbf{a}$ and $\overrightarrow{OB} = \mathbf{b}$. C is on the line AB so that AC: CB = 1:2.

Find, in terms of a and b, in its simplest form,

(a) \overrightarrow{AC} ,

Answer(a)
$$\overrightarrow{AC} = \dots$$
 [2]

(b) the position vector of C.

Answer(b)[2]

$$\mathbf{M} = \begin{pmatrix} 5 & 2 \\ -3 & 4 \end{pmatrix}$$

$$\mathbf{M} = \begin{pmatrix} 5 & 2 \\ -3 & 4 \end{pmatrix} \qquad \qquad \mathbf{N} = \begin{pmatrix} -1 & -2 \\ 2 & 6 \end{pmatrix}$$

Calculate

(a) MN,

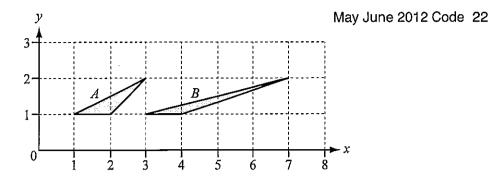
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Answer(a) MN =

[2]

(b) M^{-1} , the inverse of M.

Answer(b) $M^{-1} =$



(a) Describe fully the single transformation that maps triangle A onto triangle B.

[3] Answer(a)

(b) Find the 2×2 matrix which represents this transformation.

3 Find the values of x for which

(a)
$$\begin{pmatrix} 1 & 0 \\ 0 & 2x-7 \end{pmatrix}$$
 has no inverse,

May June 2012 Code 22

Answer(a) x = [2]

(b) $\begin{pmatrix} 1 & 0 \\ 0 & x^2 - 8 \end{pmatrix}$ is the identity matrix,

Answer (b) x = or x = [3]

(c) $\begin{pmatrix} 1 & 0 \\ 0 & x-2 \end{pmatrix}$ represents a stretch with factor 3 and the x axis invariant.

Answer (c) x =

$$\mathbf{A} = \begin{pmatrix} 2 & 4 \\ 1 & 3 \end{pmatrix} \qquad \mathbf{B} = \begin{pmatrix} 1 & 2 \end{pmatrix}$$

May June 2012 Code 23

(a) Calculate BA.

Answer(a)

[2]

(b) Find A^{-1} , the inverse of A.

Answer(b)

[2]

Find the matrix which represents the combined transformation of a reflection in the x axis followed by a reflection in the line y = x.

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Answer

[3]

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$$\mathbf{M} = \left(\begin{array}{cc} 5 & -4 \\ 2 & 3 \end{array} \right)$$

Find

(a) M^2 ,

Answer(a) [2]

(b) 2M,

Answer(b) [1]

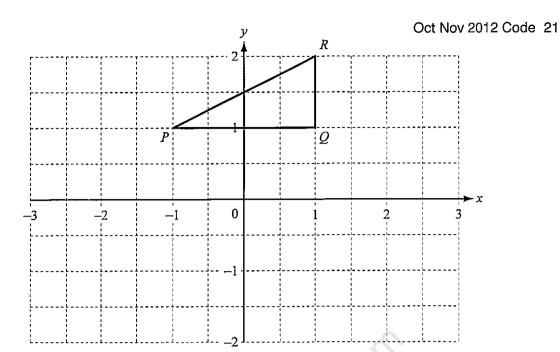
(c) |M|, the determinant of M,

Answer(c) _____ [1]

(d) M^{-1} .

Answer(d) (2)





The triangle PQR has co-ordinates P(-1, 1), Q(1, 1) and R(1, 2).

(a) Rotate triangle *PQR* by 90° clockwise about (0, 0). Label your image *P'Q'R'*.

[2]

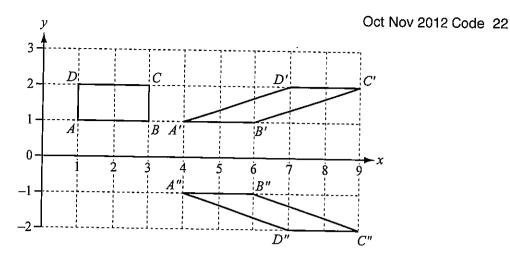
(b) Reflect your triangle P'Q'R' in the line y = -xLabel your image P''Q''R''.

[2]

[2]

(c) Describe fully the single transformation which maps triangle PQR onto triangle P''Q''R''.

Answer(c)



(a) Describe the single transformation which maps ABCD onto A' B' C' D'.

Answer(a) [3]

(b) A single transformation maps A'B'C'D' onto A''B''C''D''. Find the matrix which represents this transformation.

Answer(b) (2]

IGCSE - Cambridge

MATHEMATICS - P2

Ch 9 - Matrices & Transformations

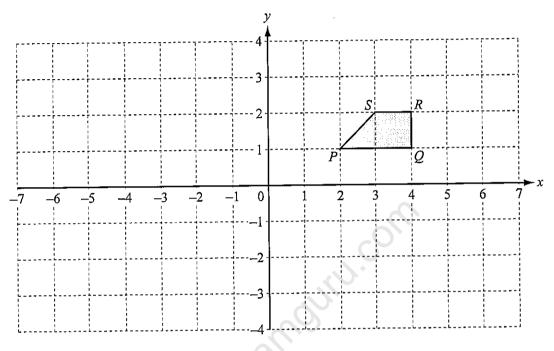
9

$$\mathbf{A} = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix} \qquad \mathbf{B} = \begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$$

Oct Nov 2012 Code 22

On the grid

draw the image of PQRS after the transformation represented by BA.



[5]

IGCSE - Cambridge

MATHEMATICS - P2

Ch 9 - Matrices & Transformations

10 (a) $M = \begin{pmatrix} 3 & 2 \\ -1 & 1 \end{pmatrix}$

Oct Nov 2012 Code 23

Find M^{-1} , the inverse of M.

Answer(a) (2]

- (b) D, E and X are 2 × 2 matrices.I is the identity 2 × 2 matrix.
 - (i) Simplify DI.

Answer(b)(i) [1]

(ii) DX = EWrite X in terms of D and E.

Answer(b)(ii) X = [1]

MATHEMATICS - P2

Ch 9 - Matrices & Transformations

 $\mathbf{11} \qquad \mathbf{A} = \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} \qquad \mathbf{B} = \begin{pmatrix} 4 & 3 \\ 1 & 2 \end{pmatrix}$

May June 2013 Code 21

Find

(a) AB,

Answer(a) AB =

[2]

(b) B^{-1} , the inverse of B.

Answer(b) $\mathbf{B}^{-1} =$

[2]

12 $\mathbf{M} = \begin{pmatrix} 2 & 3 \\ 3 & 6 \end{pmatrix}$ $\mathbf{N} = \begin{pmatrix} 2 & 1 & 5 \\ 1 & 7 & 2 \end{pmatrix}$

May June 2013 Code 23

(a) Work out MN.

Answer(a)

[2]

(b) Find M^{-1} , the inverse of M.

Answer(b)

$$\mathbf{M} = \begin{pmatrix} 2 & 1 \\ 4 & 6 \end{pmatrix} \qquad \qquad \mathbf{N} = \begin{pmatrix} 5 & 0 \\ 1 & 5 \end{pmatrix}$$

(a) Work out MN.

Oct Nov 2013 Code 22

$$Answer(a) MN =$$

[2]

(b) Find M⁻¹.

Answer(b)
$$M^{-1} =$$

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 $\mathbf{14} \qquad \mathbf{A} = \begin{pmatrix} 3 & -1 \\ 4 & 2 \end{pmatrix} \qquad \mathbf{I}$

Work out the following.

(a) AI

Answer(a) AI =

[1]

(b) A⁻¹

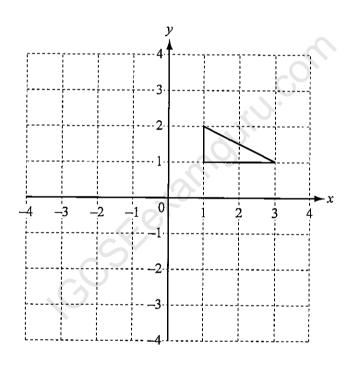
Answer(b) $A^{-1} =$

15 (p, q) is the image of the point (x, y) under this combined transformation.

$$\begin{pmatrix} p \\ q \end{pmatrix} = \begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} + \begin{pmatrix} 3 \\ 2 \end{pmatrix}$$

(a) Draw the image of the triangle under the combined transformation.

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[3]

[2]

(b) Describe fully the **single** transformation represented by $\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$.

Answer (b)

 $\mathbf{M} = \begin{pmatrix} 4 & 2 \\ 3 & 5 \end{pmatrix}$

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Find

(a) M^2 ,

Answer(a)

[2]

(b) the determinant of M.

4nswer(b)[1]

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MATHEMATICS - P2

Ch 9 - Matrices & Transformations

17

$$\mathbf{A} = \begin{pmatrix} 5 & 2 \\ 4 & 3 \end{pmatrix}$$

(a) Calculate A².

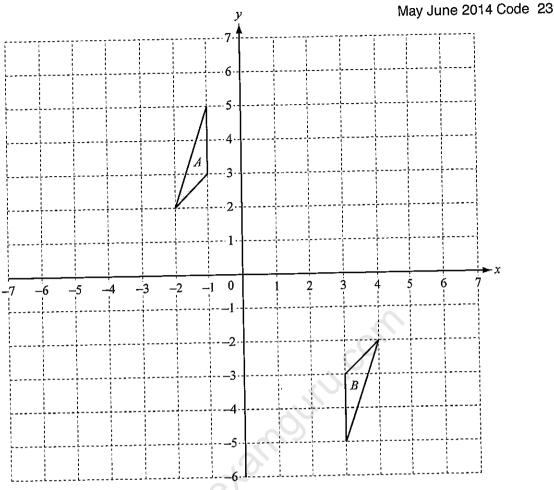
May June 2014 Code 23

Answer(a)

[2]

(b) Calculate A^{-1} , the inverse of A.

Answer(b)



- (a) Draw the image of triangle A after a translation by the vector $\begin{pmatrix} 3 \\ -4 \end{pmatrix}$. [2]
- (b) Describe fully the single transformation which maps triangle A onto triangle B.

Answer(b)[3]

(c) Draw the image of triangle A after the transformation represented by the matrix $\begin{pmatrix} -2 & 0 \\ 0 & 1 \end{pmatrix}$. [3]

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$$\mathbf{A} = \begin{pmatrix} 2 & 8 \\ 1 & 4 \end{pmatrix}$$

Work out $A^2 - 4A$.

[3]

 $\mathbf{A} = \begin{pmatrix} 3 & -2 \\ 1 & 4 \end{pmatrix} \qquad \mathbf{B} = \begin{pmatrix} 2 & 0 \\ -5 & 7 \end{pmatrix}$

Oct Nov 2014 Code 22

(a) Calculate BA.

[2]

G Sketain out ! (b) Find the determinant of A.

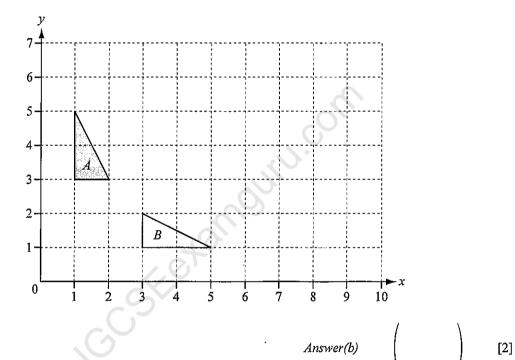
Answer(b) [1]

 $\mathbf{21} \quad \mathbf{(a)} \qquad \mathbf{N} = \begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$

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Describe fully the single transformation represented by N.

(b) Find the matrix which represents the single transformation that maps triangle A onto triangle B.



(c) On the grid, draw the image of triangle A under a stretch, factor 3, with the y-axis invariant. [2]

22 (a) Calculate $\begin{pmatrix} 3 & 7 \\ -1 & 4 \end{pmatrix} \begin{pmatrix} -2 & 1 \\ 4 & 2 \end{pmatrix}$.

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[2]

(b) Calculate the inverse of $\begin{pmatrix} 5 & 3 \\ 6 & 4 \end{pmatrix}$.

GCSE.eXainouilli.com [2]

 $\mathbf{M} = \begin{pmatrix} 3 & 1 \\ -11 & -2 \end{pmatrix}$

May June 2015 Code 22

Find M⁻¹, the inverse of M.

Answer

[2]

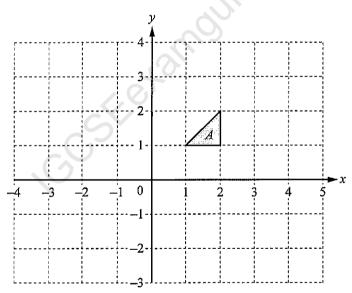
24 Find the 2×2 matrix that represents a rotation through 90° clockwise about (0, 0).

Answer () [2]

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25

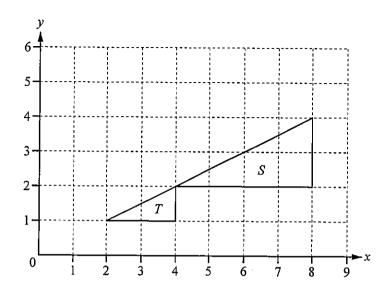


Draw the image of shape A after a translation by the vector $\begin{pmatrix} 2 \\ -3 \end{pmatrix}$.

[2]

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26



(a) Describe fully the single transformation that maps triangle S onto triangle T.

Answer(a)	
,	

(b) Find the matrix which represents the transformation that maps triangle S onto triangle T.

	1	1	
Answer(b))	[2]
	1	- 1	

0580/21/O/N/15

0580/21/O/N/15 27 (a) Work out $\begin{pmatrix} 1 & -2 \\ 3 & 4 \end{pmatrix} \begin{pmatrix} -5 & -3 \\ 2 & 1 \end{pmatrix}$.

[2]

(b) Find the inverse of $\begin{pmatrix} 1 & -2 \\ 3 & 4 \end{pmatrix}$.

[2]

(c) Explain why it is not possible to work out $\begin{pmatrix} 1 & -2 \\ 3 & 4 \end{pmatrix}$

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$$\mathbf{M} = \begin{pmatrix} 3 & -4 \\ -2 & 4 \end{pmatrix}$$

$$\mathbf{N} = \begin{pmatrix} 5 & 0 \\ 1 & 2 \end{pmatrix}$$

Calculate MN.

1	In this	question,	give all	your	answers	as fraction	ns.
---	---------	-----------	----------	------	---------	-------------	-----

May June 2012 Code 21

A box contains 3 red pencils, 2 blue pencils and 4 green pencils. Raj chooses 2 pencils at random, without replacement.

Calculate the probability that

(a) they are both red,

Answer(a)[2]

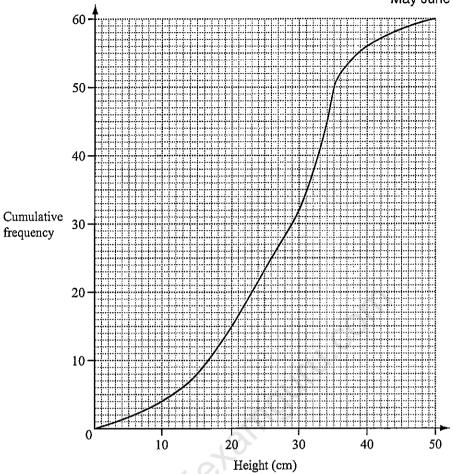
(b) they are both the same colour,

Answer(b) [3]

(c) exactly one of the two pencils is green.

 $Answer(c) \qquad [3]$





The cumulative frequency diagram shows information about the heights of 60 tomato plants. Use the diagram to find

(a)	the	median.
(a)	uic	mountain.

Answer(a) cm [1]

(b) the lower quartile,

Answer(b) cm [1]

(c) the interquartile range,

Answer(c) cm [1]

(d) the probability that the height of a tomato plant, chosen at random, will be more than 15 cm.

Answer(d) [2]

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7.

М.	ΑΤΙ	HEN	ΙΔΤΙ	ICS -	P2

Ch 10 - Statistics & Probabilities

3

Height (h cm)	0 < h ≤ 10	10 < h ≤ 15	15 < h ≤ 30
Frequency	25	и	9
Frequency density	2.5	4.8	ν

The table shows information about the heights of some flowers.

Calculate the values of u and v.

May June 2012 Code 23

Answer u =	***************************************	
		εο:

Lauris records the mass and grade of 300 eggs. The table shows the results.

Oct Nov 2012 Code 21

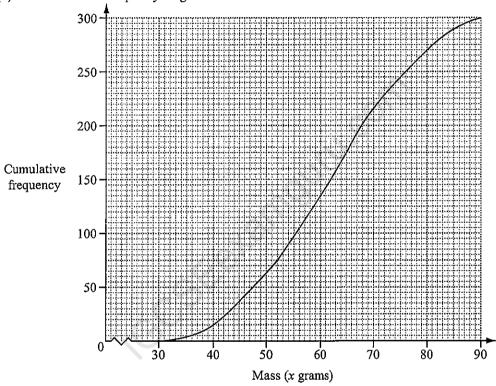
[2]

Mass (x grams)	30 < <i>x</i> ≤ 40	40 < <i>x</i> ≤ 50	50 < x ≤ 60	$60 < x \le 70$	$70 < x \le 80$	80 < x ≤ 90
Frequency	15	48	72	81	54	30
Grade	small		medium	large	very	large

(a) Find the probability that an egg chosen at random is graded very large.

Answer(a) [1]

(b) The cumulative frequency diagram shows the results from the table.



Use the cumulative frequency diagram to find

- (i) the median,
- (ii) the lower quartile,
- the inter-quartile range, (iii)
- (iv) the number of eggs with a mass greater than 65 grams.

Answer(b)(i)

Answer(b)(ii)

Answer(b)(iii)

Answer(b)(iv)

5 In a traffic survey of 125 cars the number of people in each car was recorded.

Number of people in each car	1	2	3	4	5
Frequency	50	40	10	20	5

Hi	nd	

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(a) the range,

Answer(a) [1]

(b) the median,

Answer(b) [1]

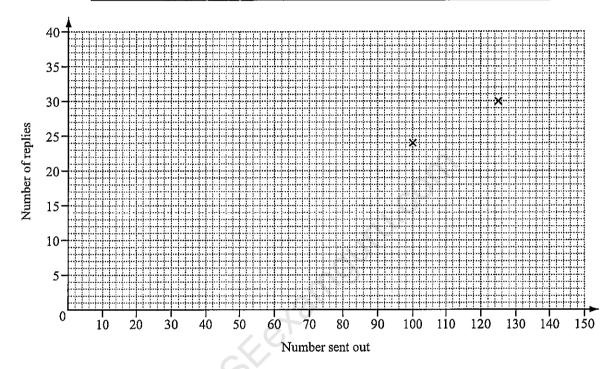
(c) the mode.

Answer(c) [1]

A company sends out ten different questionnaires to its customers.

The table shows the number sent and replies received for each questionnaire.

Questionnaire	A	В	С	D	E	F	G	H	I	J
Number sent out	100	125	150	140	70	105	100	90	120	130
Number of replies	24	30	35	34	15	25	22	21	30	31



(a) Complete the scatter diagram for these results.

The first two points have been plotted for you.

[2]

(b) Describe the correlation between the two sets of data.

Answer(b) [1]

(c) Draw the line of best fit.

[1]

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Mass of parcel (m kilograms)	0 < m ≤ 0.5	0.5 < m ≤ 1.5	1.5 < m ≤ 3
Frequency	20	18	9

The table above shows information about parcels in a delivery van.

John wants to draw a histogram using this information. Complete the table below.

Mass of parcel (m kilograms)	0 < m ≤ 0.5	0.5 < m ≤ 1.5	1.5 < m ≤ 3
Frequency density		18	

[2]

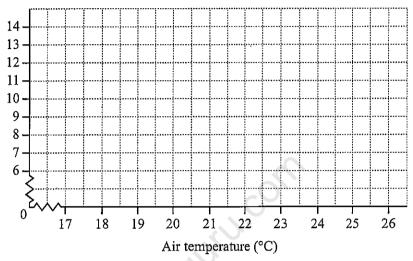
Oct Nov 2012 Code 23

8 The owner of a small café records the average air temperature and the number of hot drinks he sells each day for a week.

Air temperature (°C)	18	23	19	23	24	25	20
Number of hot drinks sold	12	8	13	10	9	7	12

(a) On the grid, draw a scatter diagram to show this information.





(b) What type of correlation does your scatter diagram show?

Answer(b)[1]

(c) Draw a line of best t on the grid.

[1]

[2]

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9 The heights, in metres, of 200 trees in a park are measured.

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Height (hm)	2 < h ≤ 6	$6 < h \le 10$	10 < h ≤ 13	13 < h ≤ 17	17 < h ≤ 19	19 < h ≤ 20
Frequency	23	47	45	38	32	15

(a) Find the interval which contains the median height.

Answer(a)[1]

(b) Calculate an estimate of the mean height.

Answer(b) m [4]

(c) Complete the cumulative frequency table for the information given in the table above.

Height (hm)	2 < h ≤ 6	<i>h</i> ≤ 10	<i>h</i> ≤ 13	<i>h</i> ≤ 17	<i>h</i> ≤ 19	<i>h</i> ≤ 20
Cumulative frequency	23					

[2]

The Ocean View Hotel has 300 rooms numbered from 100 to 399. 10 A room is chosen at random.

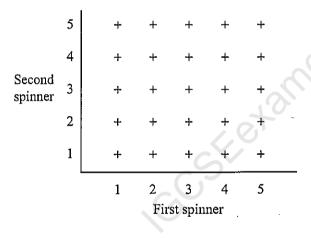
May June 2013 Code 23

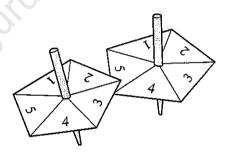
Find the probability that the room number ends in zero.

Answer[2]

Two spinners have sections numbered from 1 to 5. Each is spun once and each number is equally likely. The possibility diagram is shown below.

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Find the probability that

(a) both spinners show the same number,

Answer(a) [2]

(b) the sum of the numbers shown on the two spinners is 7.

Answer(b) [2]

S	P	A	C	$oxed{\mathbf{E}}$	S
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May June 2013 Code 23

One of the 6 letters is taken at random.

(a) Write down the probability that the letter is S.

Answer(a)[1]

(b) The letter is replaced and again a letter is taken at random. This is repeated 600 times.

How many times would you expect the letter to be S?

Answer(b)[1]

Bruce plays a game of golf.His scores for each of the 18 holes are shown below.

Oct Nov 2013 Code 22

2 3 4 5 4 6 2 3 4 4 5 3 4 3 5 4 4 4

The information is to be shown in a pie chart.

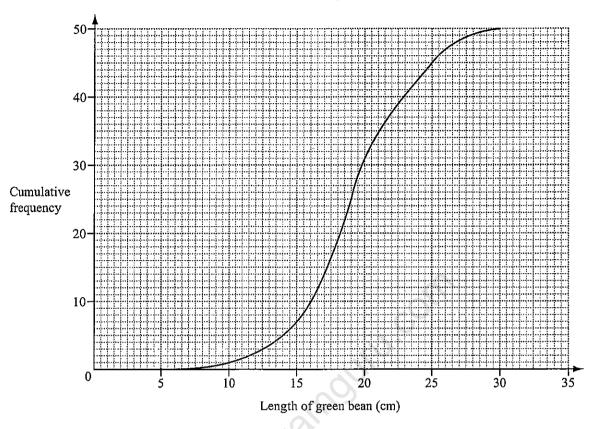
Calculate the sector angle for the score of 4.

Answer[2]

A gardener measured the lengths of 50 green beans from his garden.

The results have been used to draw this cumulative frequency diagram.

May June 2013 Code 23



Work out

(a) the median,

Answer(a) cm [1]

(b) the number of green beans that are longer than 26 cm,

Answer(b) [2]

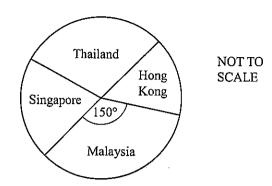
(c) the inter-quartile range,

Answer(c) cm [2]

(d) the probability that a green bean chosen at random is more than 14 cm long.

Answer(d) [2]

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A travel brochure has 72 holidays in four different countries. The pie chart shows this information.

(a) There are 24 holidays in Thailand.

Show that the sector angle for Thailand is 120°.

Answer(a)

[2]

(b) The sector angle for Malaysia is 150°. The sector angle for Singapore is twice the sector angle for Hong Kong.

Calculate the number of holidays in Hong Kong.

Answer(b) [3]

16 Michelle sells ice cream.

The table shows how many of the different avours she sells in one hour.

Flavour	Vanilla	Strawberry	Chocolate	Mango
Number sold	6	8	9	7

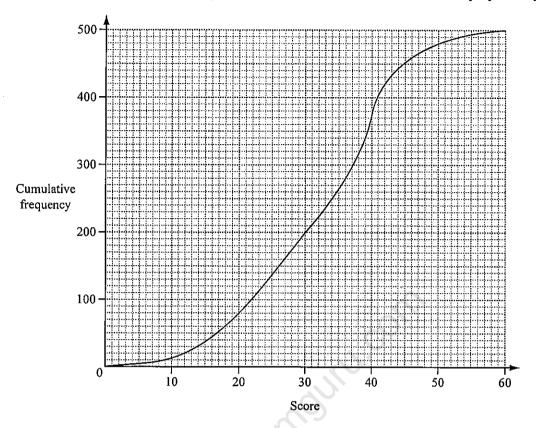
Michelle wants to show this information in a pie chart.

Calculate the sector angle for mango.

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Answer	 [2]

17 Jenna draws a cumulative frequency diagram to show information about the scores of 500 people in a quiz.



Use the diagram to nd

May June 2014 Code 23

(a) the median score,

Answer(a) [1]

(b) the inter-quartile range,

Answer(b) [2]

(c) the 40th percentile,

Answer(c) [1]

(d) the number of people who scored 30 or less but more than 20.

Answer(d) [1]

18 Cheryl recorded the midday temperatures in Seoul for one week in January.

Oct Nov 2014 Code 21

Day	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Temperature (°C)	-4	- 5	-3	-11	-8	-3	-1

(a) Write down the mode.

Answer(a) °C [1]

(b) On how many days was the temperature lower than the mode?

Answer(b) [1]

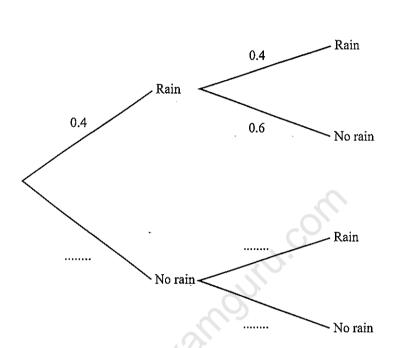
Tuesday

If it rains today the probability that it will rain tomorrow is 0.4. If it does not rain today the probability that it will rain tomorrow is 0.2. On Sunday it rained.

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(a) Complete the tree diagram for Monday and Tuesday.

Monday



[2]

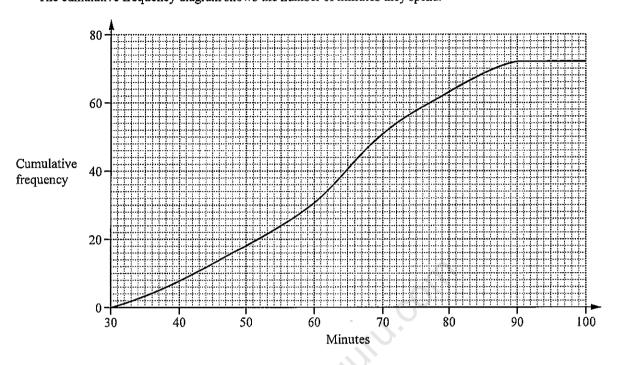
(b) Find the probability that it rains on at least one of the two days shown in the tree diagram.

Answer(b)[3]

20 72 students are given homework one evening.

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They are told to spend no more than 100 minutes completing their homework. The cumulative frequency diagram shows the number of minutes they spend.



(a) How many students spent more than 48 minutes completing their homework?

Answer(a) [2]

- (b) Find
 - (i) the median,

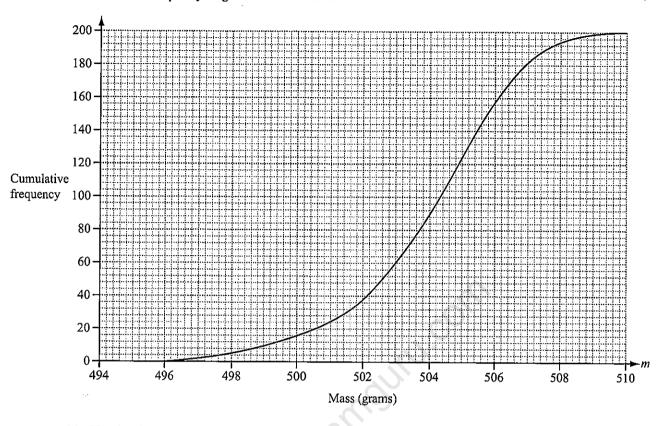
Answer(b)(i) [1]

(ii) the inter-quartile range.

Answer(b)(ii) [2]

21 The mass, m grams, of corn akes in each of 200 boxes is recorded. The cumulative frequency diagram shows the results.

Oct Nov 2014 Code 23



(a) Use the diagram to estimate the inter-quartile range.

Answer(a) g [2]

(b) Find the probability that a box chosen at random has a mass of 500 grams or less.

Answer(b) [2]

(c)

Mass (m grams)	496 < m ≤ 500	500 < m ≤ 504	504 < m ≤ 508	508 < m ≤ 510
Frequency	16	74	104	6

The data in this frequency table is to be shown in a histogram.

Complete the frequency density table below.

Mass (m grams)	496 < m ≤ 500	500 < m ≤ 504	504 < m ≤ 508	508 < m ≤ 510
Frequency density	4		<u>.</u>	

[2]

Write down a possible value for this number.

Answer(b) [1]

A biased 4-sided dice is rolled.

The possible scores are 1, 2, 3 or 4.

May June 2015 Code 22

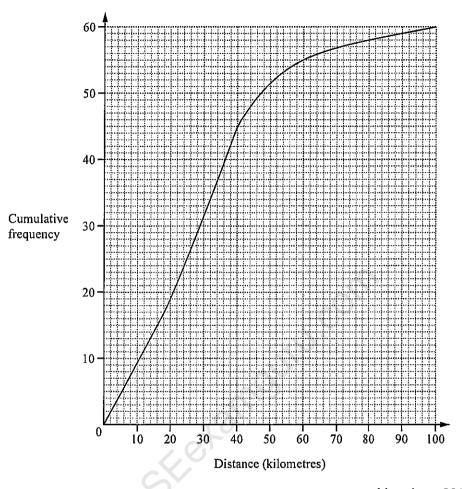
The probability of rolling a 1, 3 or 4 is shown in the table.

Score	1	2	3	4
Probability	0.15		0.3	0.35

Complete the table.

[2]

25 The cumulative frequency diagram shows information about the distances travelled, in kilometres, by 60 people.



Find

May June 2015 Code 22

(a) the 80th percentile,

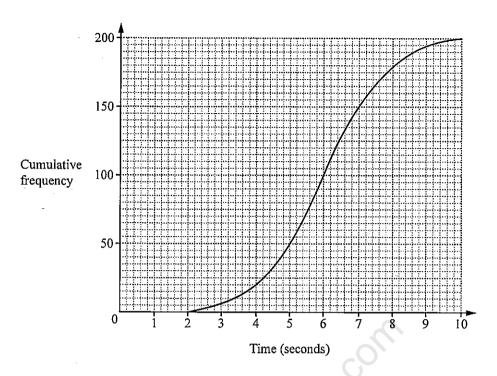
Answer(a) km [2]

(b) the inter-quartile range,

Answer(b) km [2]

(c) the number of people who travelled more than 60 km.

Answer(c) [2]



200 students take a reaction time test.

The cumulative frequency diagram shows the results.

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Find

(a) the median,

Answer(a) s [1]

(b) the inter-quartile range,

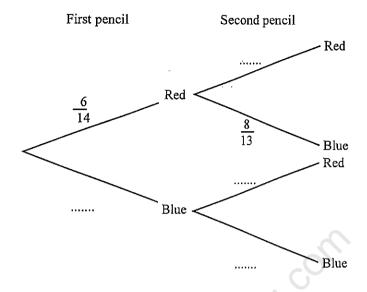
Answer(b) s [2]

(c) the number of students with a reaction time of more than 4 seconds.

Answer(c) [2]

0580/22/O/N/15

- A box contains 6 red pencils and 8 blue pencils. A pencil is chosen at random and not replaced.
 - A second pencil is then chosen at random.
 - (a) Complete the tree diagram.



[2]

- (b) Calculate the probability that
 - both pencils are red,

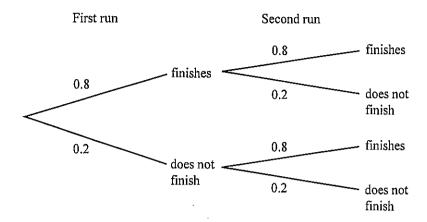
Answer(b)(i)[2]

(ii) at least one of the pencils is red.

0580/23/O/N/15

Samira takes part in two charity runs.

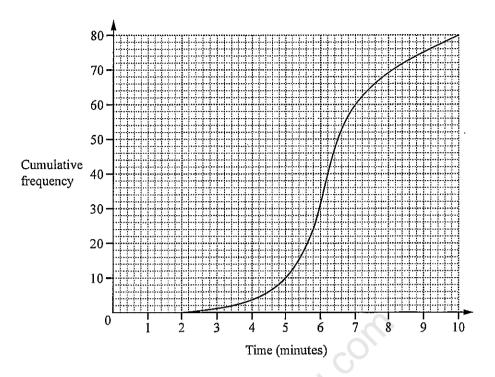
The probability that she finishes each run is 0.8.



Find the probability that Samira finishes at least one run.

0580/23/O/N/15

29



The cumulative frequency diagram shows information about the times, in minutes, taken by 80 students to complete a short test.

Find

(a) the median,

Answer(a) min [1]

(b) the 30th percentile,

Answer(b) min [2]

(c) the number of students taking more than 5 minutes.

Answer(c)[2]

$$f(x) = (x+2)^3 - 5$$

$$g(x) = 2x + 10$$

$$h(x) = \frac{1}{x}, \ x \neq 0$$

Find

(a) gf(x),

May June 2012 Code 22

Answer(a) gf(x) = [2]

(b) $f^{-1}(x)$,

 $Answer(b) f^{-1}(x) =$ [3]

(c) $gh(-\frac{1}{5})$.

Answer(c) _____[2]

IGCSE - Cambridge

MATHEMATICS - P2

Ch 11 - Functions

2

$$f(x) = 4(x+1)$$
 $g(x) = \frac{x^3}{2} - 1$

(a) Write down the value of x when $f^{-1}(x) = 2$.

Oct Nov 2012 Code 21

$$Answer(a) x =$$
 [1]

(b) Find fg(x). Give your answer in its simplest form.

Answer(b)
$$fg(x) =$$
 [2]

(c) Find $g^{-1}(x)$.

Answer(c)
$$g^{-1}(x) =$$
 [3]

3
$$f(x) = x^2 + 1$$
 $g(x) = \frac{x+2}{3}$

Oct Nov 2012 Code 22

(a) Work out ff(-1).

Answer(a) _____[2]

(b) Find gf(3x), simplifying your answer as far as possible.

Answer(b) gf(3x) = [3]

(c) Find $g^{-1}(x)$.

 $Answer(c) g^{-1}(x) =$ [2]

$$f(x) = 3x + 5$$
 $g(x) = 4x - 1$

Oct Nov 2012 Code 23

(a) Find the value of gg(3).

(b) Find fg(x), giving your answer in its simplest form.

$$Answer(b)fg(x) =$$
 [2]

(c) Solve the equation.

$$f^{-1}(x) = 11$$

$$Answer(c) x =$$
 [1]

$$f(x) = 5x + 4$$

$$g(x) = \frac{1}{2x}, \quad x \neq 0 \qquad h(x) = \left(\frac{1}{2}\right)^x$$

$$h(x) = \left(\frac{1}{2}\right)^x$$

Find

(a)
$$fg(5)$$
,

May June 2013 Code 22

(b) gg(x) in its simplest form,

(c) $f^{-1}(x)$,

Answer(c)
$$f^{-1}(x) = \dots [2]$$

(d) the value of x when h(x) = 8.

$$f(x) = x + \frac{2}{x} - 3, \ x \neq 0$$

 $g(x) = \frac{x}{2} - 5$

May June 2013 Code 23

Find

(a) fg(18),

Answer(a)[2]

(b) $g^{-1}(x)$.

Answer(b) $g^{-1}(x) = \dots$ [2]

7
$$f(x) = 2x + 3$$
 $g(x) = x^2$

Oct Nov 2013 Code 23

(a) Find fg(6).

Answer(a) [2]

(b) Solve the equation gf(x) = 100.

Answer(b) x = or x = [3]

(c) Find $f^{-1}(x)$.

Answer(c) $f^{-1}(x) = \dots [2]$

(d) Find $ff^{-1}(5)$.

Answer(d)[1]

$$f(x) = 3x - 2$$

$$g(x) = \frac{2}{x+1} , \quad x \neq -1$$

(a) Find gf(2).

Oct Nov 2014 Code 21

Answer(a) [2]

(b) Solve g(x) = 10.

(c) Simplify.

Answer(c)[3]

$$f(x) = (x-3)^2$$

$$g(x) = \frac{x-1}{4}$$

$$h(x) = x^3$$

Find

(a)
$$hf(1)$$
,

Oct Nov 2014 Code 23

Answer(a)[2]

(b) $g^{-1}(x)$,

(c) gh(x),

(d) the solution to the equation f(x) = 0.

 $Answer(d) x = \dots [1]$

Answer(d) $f^{-1}(x) =$ [2]

$$f(x) = x^2 + 4x - 6$$

May June 2015 Code 22

(a) f(x) can be written in the form $(x + m)^2 + n$.

Find the value of m and the value of n.

(b) Use your answer to part (a) to find the positive solution to $x^2 + 4x - 6 = 0$.

$$f(x) = 3x + 5$$

$$g(x) = x^2$$

May June 2015 Code 22

(a) Find g(3x).

Answer(a)[1]

(b) Find $f^{-1}(x)$, the inverse function.

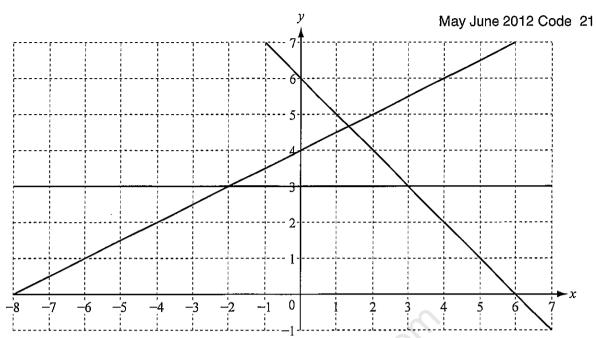
Answer(b) $f^{-1}(x) = \dots [2]$

(c) Find ff(x).
Give your answer in its simplest form.

Answer(c) [2]

		Ch 11 - Function
g(x) = 3x - 5	h(x) = 2x + 1	
	Answer(a)	[2
	MOJINJ. CON	
e of $h(x)$.	Answer(b)	[2]
	fy your answer,	Answer(a) fy your answer, Answer(b)

Answer(c)
$$h^{-1}(x) =$$
 [2]



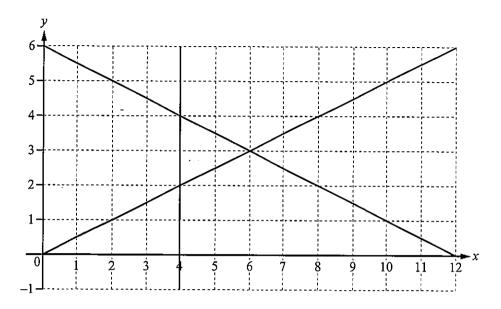
The region R contains points which satisfy the inequalities

$$y \le \frac{1}{2}x + 4$$
, $y \ge 3$ and $x + y \ge 6$.

On the grid, label with the letter R the region which satisfies these inequalities.

You must shade the unwanted regions.

[3]



By shading the unwanted regions of the grid, and label the region R which satis es the following four inequalities.

$$y \ge 0$$

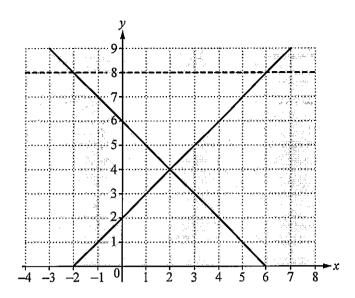
$$x \ge 4$$

$$2y \le x$$

$$2y + x \le 12$$

[3]

Oct Nov 2014 Code 22



Write down the 3 inequalities which define the unshaded region.

Answer	
	[4]

May June 2015 Code 21

1 Find the *n*th term in each of the following sequences.

Oct Nov 2013 Code 21

(a) $\frac{1}{3}$, $\frac{2}{4}$, $\frac{3}{5}$, $\frac{4}{6}$, $\frac{5}{7}$,

Answer(a)[1]

(b) 0, 3, 8, 15, 24,

Answer(b) [2]

² 32 25 18 11 4

These are the rst 5 terms of a sequence.

May June 2014 Code 22

Find

(a) the 6th term,

Answer(a)[1]

(b) the nth term,

Answer(b) [2]

(c) which term is equal to -332.

Answer(c) [2]

(a) Here are the rst three terms of a sequence.

$$U_1 = 1^3$$

$$U_2 = 1^3 + 2^3$$

$$U_3 = 1^3 + 2^3 + 3^3$$

The *n*th term is given by $U_n = \frac{1}{4}n^2(n+1)^2$.

Oct Nov 2014 Code 23

Work out the value of U_{39} .

Answer(a)
$$U_{39} =$$
 [2]

(b) Here are the rst three terms of another sequence.

$$V_1 = 2^3$$

$$V_2 = 2^3 + 4^3$$

$$V_2 = 2^3 + 4^3$$
 $V_3 = 2^3 + 4^3 + 6^3$

By comparing this sequence with the sequence in part (a), nd a formula for the nth term, V_n .

- Find the *n*th term of each sequence.
 - (a) 4, 8, 12, 16,

May June 2015 Code 21

Answer(a)[1]

35, **(b)** 11, 20, 56,

Answer(b) [2]

IGCSE - Cambridge			<u> </u>		MA	THEMATICS - P2	Ch 13 - Sequences
5	5,	11,	21,	35,	53,	···	

Find the nth term of this sequence.

Answer [2]

May June 2015 Code 22

DECIMALS (2018)

1.

Write the recurring decimal 0.63 as a fraction.

.....[1]

UPPER AND LOWER BOUND (2018)

1.	
	na walks 31km at a speed of 5km/h. th values are correct to the nearest whole number.
Wo	rk out the upper bound of the time taken for Anna's walk.
	hours [2]
_	
2. (a)	The length of the side of a square is 12cm, correct to the nearest centimetre.
(-)	
	Calculate the upper-bound for the perimeter of the square.
	40
	cm [2]
(b)	Jo measures the length of a rope and records her measurement correct to the nearest ten centimetres. The upper bound for her measurement is 12.35 m.
	Write down the measurement she records.
	m [1]

STANDARD FORM (2018)

1.						
Wri	te 0.000 0387 in s	tandard form.				
					***************************************	[1]
2.						
Her	e are some numbe	ers written in sta	ndard form.			
	3.4×10^{-1}	$1.36\!\times\!10^6$	7.9×10^{0}	2.4×10^5	5.21×10^{-3}	4.3×10^{-2}
Fron	n these numbers,	write down				
(a)	the largest numb	er,				
(b)	the smallest num	ıber.		. C	1:00	[1]
3.			,			
(a)	Write 4.82×10	³ as an ordinary	number.	2		
(b)	Write 52 million	in standard for	m. 5			[1]
						[1]

PERCENTAGES (2018)

1.

Increase \$22 by 15%.

\$.....[2]

SPEED, DISTANCE AND TIME (2018)

1.	
Liz takes 65 seconds to run 400 m.	
Calculate her average speed.	
	m/s [1]

FORMULAEE (2018)

CSE ASIMONINI. COM

1.

Find the value of 7x + 3y when x = 12 and y = -6.

.....[2]

BRACKETS AND SYMPLIFYING (2018)

1.		
Expand. $7(x-8)$		
	[1]
2.		
Expand and simplify. $6(2y-3)-5(y$	+ 1)	
	COLU	
	[2]
3.		
Simplify. $\frac{3+x}{9-x^2}$		
	SKO,	
C	[2]
4.		
Expand the brackets and simplify.	+3)(3 <i>p</i> -2)	
(·P		
	[3]

LINEAR EQUAETION (2018)

1.

Complete these statements.

(a) When
$$w = \dots, 10w = 70$$
. [1]

(b) When
$$5x = 15$$
, $12x = \dots$ [1]

2.

Solve.

$$\frac{1-p}{3} = 4$$

p =[2]

FACTORISING (2018)

1.				
Factorise. $w + w^3$				
				[1]
2.				
Factorise completely. $xy + 2y$	+ 3 <i>x</i> + 6			
			coin	
				[2]
3.				
Factorise completely. $2a+4b$	-ax-2bx	1 SILVES		
		70		
	COS.			
				[2]

CHANGING THE SUBJECT (2018)

1.

$$A = (2\pi + y)x^2$$

Rearrange the formula to make x the subject.

x = [2]

VARIATION (2018)

1.	
y is directly proportional to $(x-1)^2$. When $x = 5$, $y = 4$.	
Find y when $x = 7$.	
	<u> </u>
7	<i>y</i> =[3]
A ball falls d metres in t seconds.	.1).
d is directly proportional to the square of t. The ball falls 44.1 m in 3 seconds.	
(a) Find a formula for d in terms of t.	
0,10	
(a) Find a formula for d in terms of t.	
	d =[2]
(b) Calculate the distance the ball falls in 2 seconds.	
	m [1]

INDICES (2018)

1.

$$3^{-q} \times \frac{1}{27} = 81$$

Find the value of q.

q =[2]

2.

(a) Find the value of $\left(\frac{1}{81}\right)^{-\frac{2}{4}}$.

(b) Simplify. $\sqrt[3]{27t^{27}}$

.....[1]

.....[2]

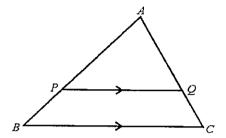
SOLVING INEQUALITIES (2018)

1. Solve the inequality. 3n-5 > 17 + 8n

PARALLEL LINES (2018)

1.

(a)



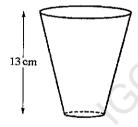
NOT TO SCALE

In the diagram, PQ is parallel to BC. APB and AQC are straight lines. PQ = 8 cm, BC = 10 cm and AB = 9 cm.

Calculate PB.

 $PB = \dots$ cm [2]

(b)





NOT TO SCALE

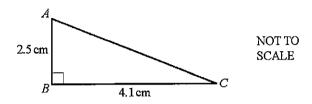
The diagram shows two glasses which are mathematically similar. The larger glass has a capacity of 0.5 litres and the smaller glass has a capacity of 0.25 litres. The height of the larger glass is 13 cm.

Calculate the height of the smaller glass.

...... cm [3]

PYTHAGORAS THEOREM (2018)

1.

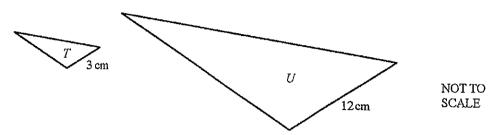


Calculate the length of AC.

AC = cm [2]

AREAS & VOLUMES OF SIMILAR SHAPES (2018)

1.

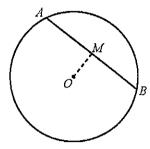


The diagram shows two mathematically similar triangles, T and U. GCSF.eXamouni.cof Two corresponding side lengths are 3 cm and 12 cm. The area of triangle T is $5 \,\mathrm{cm}^2$.

Find the area of triangle U.

CIRCLE THEOREM (2018)

1.



NOT TO SCALE

The diagram shows a circle, centre O. AB is a chord of length 12 cm. M is the mid-point of AB and OM = 4.5 cm.

Calculate the radius of the circle.

..... cm [3]

CONSTRUCTIONS AND LOCI (2018)

1.

Using a straight edge and compasses only, construct the locus of points that are equidistant from A and B.

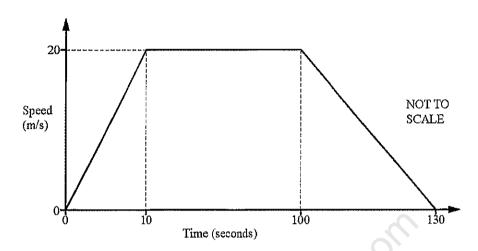
[2]

LINES (2018)

1.	
(a)	Point A has co-ordinates $(1, 0)$ and point B has co-ordinates $(2, 5)$.
	Calculate the angle between the line AB and the x-axis.
	[3]
(b)	The line PQ has equation $y = 3x - 8$ and point P has co-ordinates (6, 10).
(0)	
	Find the equation of the line that passes through P and is perpendicular to PQ . Give your answer in the form $y = mx + c$.
	1.07
	y =[3]
	<i>y</i> =[3]

SPEED-TIME GRAPHS (2018)

1.



The speed-time graph shows information about the journey of a tram between two stations.

(a) Calculate the distance between the two stations.

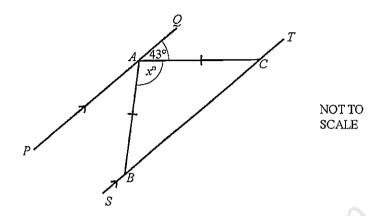
.....m [3]

(b) Calculate the average speed of the tram for the whole journey.

......m/s [1]

ANGLES (2018)

1.



The diagram shows two parallel lines PAQ and SBCT. AB = AC and angle $QAC = 43^{\circ}$.

Find the value of x.

 $x = \dots [2]$