UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME

CENTER NUMBER | | | | | |

CANDIDATE NUMBER | | | | |

6752529559

MATHEMATICS (US) **0444/13**

Paper 1 (Core) **October/November 2013**

1 hour

Candidates answer on the Question Paper.

Additional Materials: Geometrical instruments

READ THESE INSTRUCTIONS FIRST

Write your Center number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use a pencil for any diagrams or graphs.
Do not use staples, paper clips, highlighters, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.
CALCULATORS MUST NOT BE USED IN THIS PAPER.
All answers should be given in their simplest form.
If work is needed for any question it must be shown in the space provided.

The number of points is given in parentheses [ ] at the end of each question or part question.
The total of the points for this paper is 56.

This document consists of **12** printed pages.

Formula List

Area, A, of triangle, base b, height h.	$A = \frac{1}{2}bh$
Area, A, of circle, radius r.	$A = \pi r^2$
Circumference, C, of circle, radius r.	$C = 2\pi r$
Lateral surface area, A, of cylinder of radius r, height h.	$A = 2\pi rh$
Surface area, A, of sphere of radius r.	$A = 4\pi r^2$
Volume, V, of prism, cross-sectional area A, length l.	$V = Al$
Volume, V, of cylinder of radius r, height h.	$V = \pi r^2 h$
Volume, V, of sphere of radius r.	$V = \frac{4}{3}\pi r^3$

1 The table shows the daily takings, correct to the nearest dollar, of a shop during one week.

Day	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Takings ($)	153	201	178	231	164	147	156

Find the range.

Answer $ ..... [1]

---

2 Factor.

$2a^2 - 5a$

Answer ..... [1]

---

3 The table shows the average monthly temperatures in Ulaanbaatar, Mongolia.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temperature (°C)	–25	–30	–12	–2	6	13	17	10	7	0	–13	–22

By how many degrees does the temperature rise between March and July?

Answer ..... [1]

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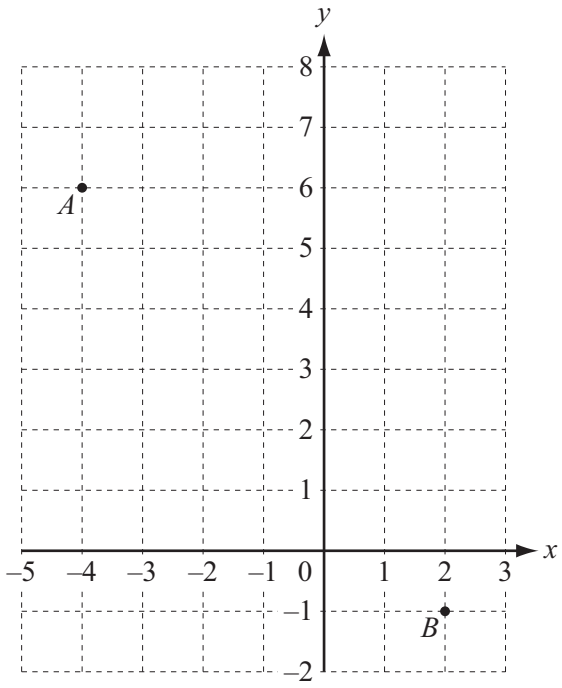
4 The diagram shows two points, A and B.



Write $\overrightarrow{AB}$ in component form.

Answer ( ) [1]

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5 Christa had a music lesson every week for one year.
Each of the 52 lessons lasted for 45 minutes.

Calculate the total time that Christa spent in music lessons.
Give your time in hours.

Answer ..... h [2]

---

6 **(a)** Write 2563 correct to the nearest 100.

Answer(a) ..... [1]

(b) Write 0.0584 correct to 2 significant digits.

Answer(b) ..... [1]

7

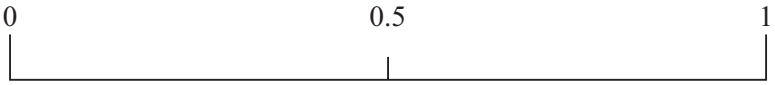
A B C D E F G H I J K

(a) A letter is chosen at random from the list above.

Write down, as a fraction, the probability that the letter has **no** curved parts.

Answer(a) ..... [1]

(b) On the probability scale, mark an arrow to show this probability.



[1]

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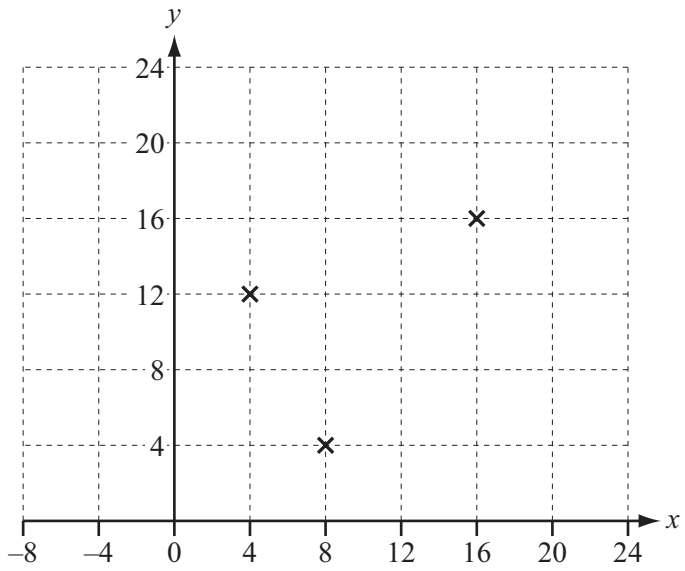
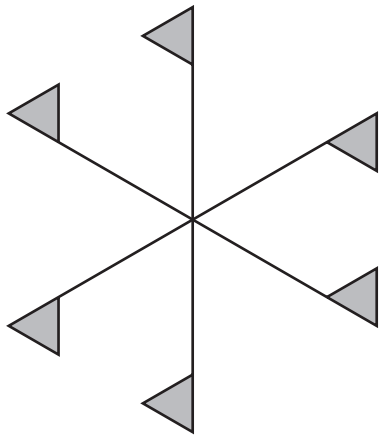
8 Three of the vertices of a parallelogram are at (4, 12), (8, 4) and (16, 16).



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

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

9



For the diagram, write down

(a) the number of lines of symmetry,

Answer(a) ..... [1]

(b) the order of rotational symmetry.

Answer(b) ..... [1]

---

10 Write down the type of correlation you would expect when values for the following are plotted.

(a) Total amount of time spent training for long distance races and time taken to run a marathon.

Answer(a) ..... [1]

(b) Total amount of time spent training for throwing the javelin and the distance the javelin is thrown.

Answer(b) ..... [1]

11

Point B is 5.5 cm from point A on a bearing of 132°.

Draw accurately the line AB. [2]

---

12 Solve the equation.

$$4x + 3 = 10$$

Answer $x =$ ..... [2]

---

13 Work out $3\frac{1}{7} - 1\frac{2}{5}$.

Give your answer as a fraction in lowest terms.

Answer ..... [3]

---

14 Solve the system of linear equations.

$$5x + 6y = 3$$
$$4x - 3y = 18$$

Answer $x =$ .....

$y =$ ..... [3]

---

15 Find, in scientific notation, the value of

(a) $\dfrac{6 \times 10^3}{2 \times 10^{-1}}$,

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

(b) $3 \times 10^5 + 1.2 \times 10^4$.

Answer(b) ..... [2]

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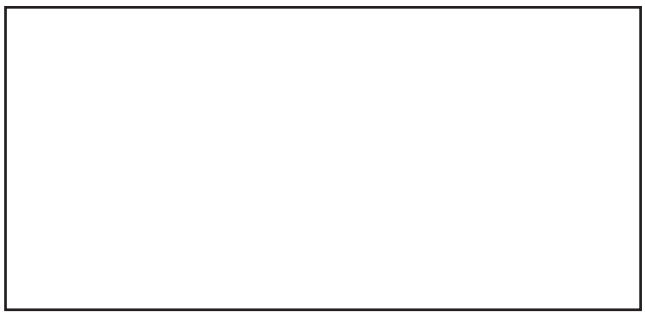
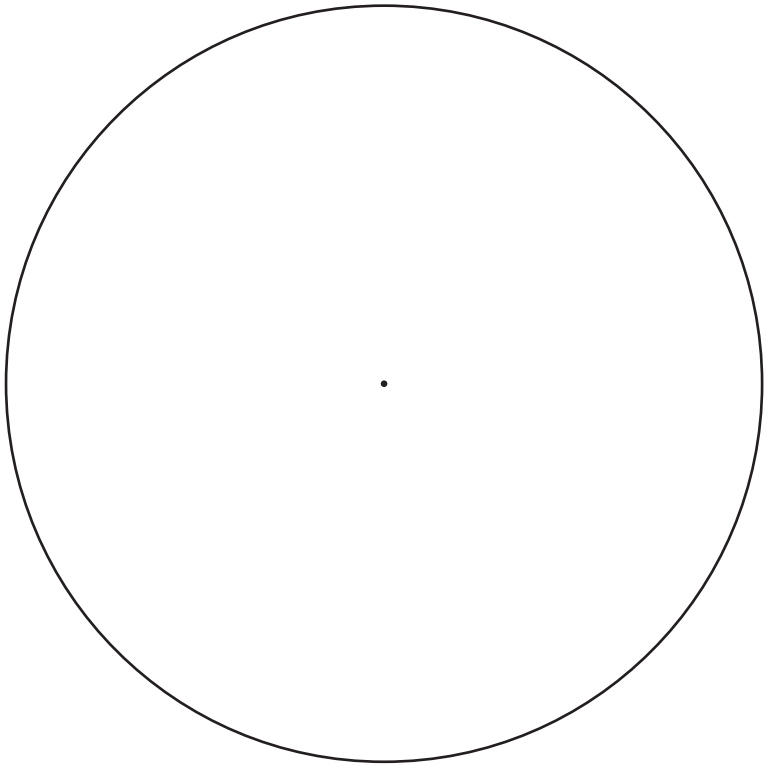
16 In this question use a straight edge and compass only.

(a) Construct one of the lines of symmetry of the rectangle.



[2]

(b) Construct a regular hexagon inscribed in the circle.



[2]

17 Using only the integers from 21 to 80, find

(a) a number that is a multiple of both 5 and 7,

Answer(a) ..... [1]

(b) a perfect square that is even,

Answer(b) ..... [1]

(c) a cubic number,

Answer(c) ..... [1]

(d) a prime number which is one more than a multiple of 5.

Answer(d) ..... [1]

---

18 **(a)** Simplify.

$3x - 5y + 8x - 2y$

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

(b) Expand and simplify.

$4(2a - 3b) - 5(a - 2b)$

Answer(b) ..... [2]

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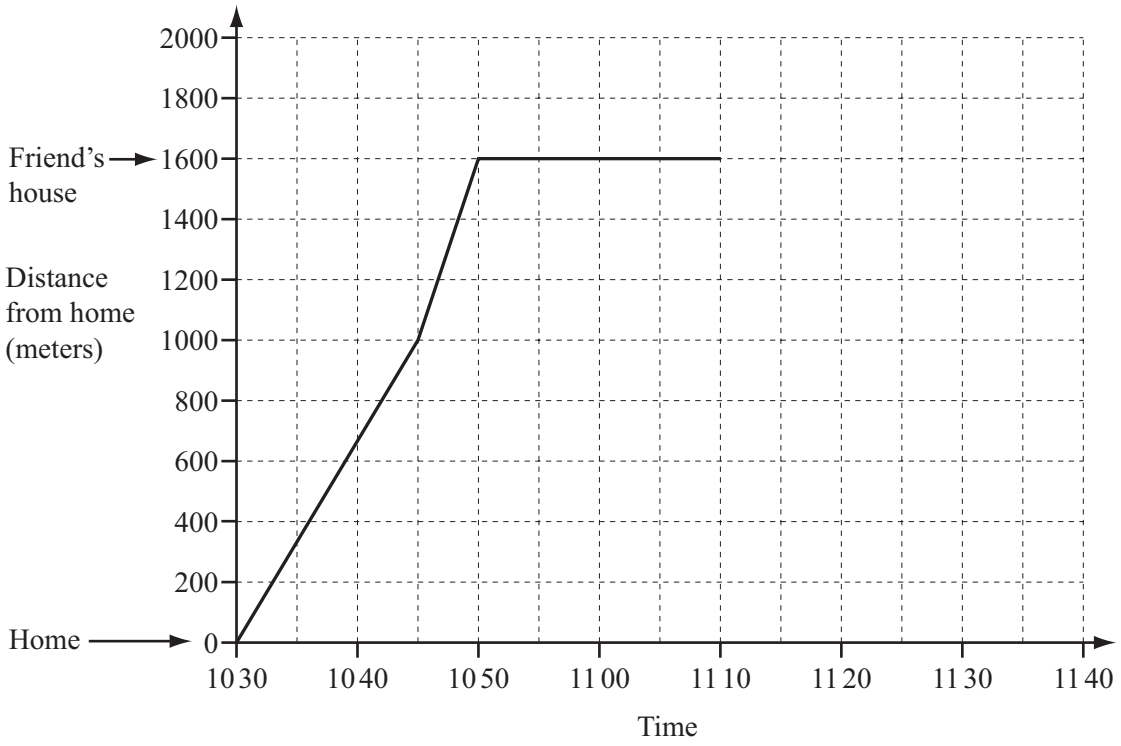
19 The travel graph shows Natasha's visit to her friend's house.
She starts by walking and then runs.
She stays at her friend's house until 11 10 before returning home.



(a) (i) How far does Natasha **walk** on the journey to her friend's house?

Answer(a)(i) ..... m [1]

(ii) Find Natasha's average speed, in meters per minute, on the journey to her friend's house.

Answer(a)(ii) ..... m/min [2]

(iii) How long does Natasha stay at her friend's house?

Answer(a)(iii) ..... min [1]

(b) Natasha returns home at a constant speed of 64 meters per minute.

(i) Complete the travel graph. [2]

(ii) Write down the time she arrives home.

Answer(b)(ii) ..... [1]

Question 20 is printed on the next page.

20 $f(x) = \frac{2}{x}, \quad x \neq 0$.

(a) Find

(i) f(–8),

Answer(a)(i) ..... [1]

(ii) $f\left(\frac{1}{2}\right)$.

Answer(a)(ii) ..... [1]

(b) Find and simplify an expression for f(2x).

Answer(b) ..... [1]

(c) Solve f(x) = 6.

Answer(c) ..... [2]

(d) Complete the statement.

The **single** transformation that maps the graph of y = f(x) onto the graph of y = 4f(x) is a stretch ..... [2]