



MATHEMATICS

0580/33

Paper 3 (Core)

October/November 2017

MARK SCHEME

Maximum Mark: 104

Published

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Abbreviations

| | |
|------|----------------------------|
| cao | correct answer only |
| dep | dependent |
| FT | follow through after error |
| isw | ignore subsequent working |
| oe | or equivalent |
| SC | Special Case |
| nfww | not from wrong working |
| soi | seen or implied |

| Question | Answer | Marks | Partial marks |
|-----------|-------------------|------------|--|
| 1(a)(i) | 800 | 1 | |
| 1(a)(ii) | 48 | 2 | M1 for $\frac{160}{2+5+3} [\times 3]$ |
| 1(a)(iii) | 60 | 1 | |
| 1(b)(i) | 43.5[0] | 2 | M1 for $3 \times 7.5[0] + 2 \times 10.5[0]$ |
| 1(b)(ii) | 7.6[0] | 2 | M1 for $9.5 \left(1 - \frac{20}{100}\right)$ oe |
| 1(c)(i) | 102 138 | 2 | M1 for $\frac{85}{300} \times 360$ or $\frac{115}{300} \times 360$ or $\frac{120}{100} \times 85$ or $\frac{120}{100} \times 115$ oe |
| 1(c)(ii) | 3 correct sectors | 2FT | FT if <i>their</i> angles add to 240° B1FT for one correct sector |
| 1(d) | 40 | 3 | M2 for $\frac{31.50 - 22.50}{22.50} \times 100$ or $\left(\frac{31.50}{22.50} - 1\right) \times 100$ oe or M1 for $\frac{31.50 - 22.50}{22.50}$ or $\frac{31.50}{22.50} - 1$ or $\frac{31.50}{22.50} \times 100$ oe |
| 2(a)(i) | 9 | 1 | |
| 2(a)(ii) | 4 | 1 | |
| 2(b)(i) | 1.4 | 1 | |
| 2(b)(ii) | 4096 | 1 | |
| 2(c) | [0].043 cao | 2 | M1 for 0.0426... or $\frac{367}{8610}$ |

| Question | Answer | Marks | Partial marks |
|-----------|---|------------|--|
| 2(d) | 64.8 | 2 | M1 for $\frac{1}{3} \times 4.5^2 \times 9.6$ or $\frac{324}{5}$ |
| 2(e) | $\sqrt{5}$ indicated | 1 | |
| 2(f)(i) | 300 | 1 | |
| 2(f)(ii) | $2^4 \times 5$ or $2 \times 2 \times 2 \times 2 \times 5$ | 2 | M1 for 2, 2, 2, 2, 5 or $2^4, 5$ or $1 \times 2 \times 2 \times 2 \times 2 \times 5$ or $1 \times 2^4 \times 5$ |
| 2(f)(iii) | 20 | 2 | B1 for 2 or 4 or 5 or 10 as answer or $2^2 \times 5$ as answer |
| 3(a)(i) | Chord | 1 | |
| 3(a)(ii) | Tangent | 1 | |
| 3(b)(i) | 48 | 1 | |
| 3(b)(ii) | 66 | 2 | M1 for $180 - 48$ soi by 132 |
| 3(b)(iii) | 42 | 2FT | 2FT for $90 - \text{their (b)(i)}$ or B1 for angle $OCQ = 90$ soi |
| 4(a) | Scalene | 1 | |
| 4(b) | Translation | 1 | |
| | $\begin{pmatrix} -5 \\ -4 \end{pmatrix}$ | 1 | |
| 4(c) | Correct rotation Vertices (2, -1), (2, -4), (3, -2) | 2 | B1 for correct orientation but wrong position or for rotation of 90° anticlockwise about origin |
| 4(d)(i) | 1.5 oe | 1 | |
| 4(d)(ii) | Correct enlargement Vertices (1, 3), (3, 5), (7, 3) | 2 | B1 for correct size and orientation, incorrect position |
| 4(d)(iii) | 4 | 2 | M1 for $\frac{1}{2} \times 6 \times 2$ soi by 6 or correct method to find area of <i>their</i> triangle |

| Question | Answer | Marks | Partial marks |
|-----------|--------------------------------|-------|--|
| 5(a)(i) | $n + 10$ | 1 | |
| 5(a)(ii) | $2(n + 10)$ oe isw | 1FT | |
| 5(a)(iii) | <i>their (ii)</i> = 52 | M1 | |
| | 16 final answer | B2 | M1 for $2n = 52 - 20$ or $n = 26 - 10$ or better |
| 5(a)(iv) | 42 | 1FT | FT $2 \times \textit{their (iii)} + 10$ |
| 5(b)(i) | $\frac{1}{4}$ cao | 2 | B1 for $\frac{13}{52}$ oe soi |
| 5(b)(ii) | Correct arrow at $\frac{3}{4}$ | 1 | |
| 5(c) | 2.7[00] | 2 | B1 for answer figs 27 or for 0.45 seen |
| 5(d) | 115 125 | 2 | B1 for one correct or both values correct but reversed |
| 6(a)(i) | 4.5 | 2 | M1 for ordered list of at least 6 values or B1 for 4.3 and 4.7 both identified |
| 6(a)(ii) | 8 | 1 | |
| 6(a)(iii) | 5.18 | 2 | M1 for sum of 10 distances $\div 10$ |
| 6(b)(i) | 15 50 or 3.50 pm | 2 | M1 for $9 \div 6$ or 1.5 hours oe seen |
| 6(b)(ii) | 100 | 2 | M1 for 6×1000 or $6 \div 60$ soi |
| 6(c)(i) | Positive | 1 | |
| 6(c)(ii) | Point (4, 68) indicated | 1 | |
| 7(a)(i) | -3 -6 6 3 | 2 | B1 for 2 or 3 values correct |
| 7(a)(ii) | Correct curve | 4 | B3FT for 7 or 8 correctly plotted points or B2FT for 5 or 6 correctly plotted points or B1FT for 3 or 4 correctly plotted points |
| 7(a)(iii) | Ruled line $y = -5$ | 1 | |
| 7(a)(iv) | -2.5 to -2.3 | 1FT | FT intersection of <i>their</i> line with <i>their</i> curve |

| Question | Answer | Marks | Partial marks |
|-----------|--|-----------|---|
| 7(b)(i) | -0.5 oe | 2 | M1 for $\frac{\text{rise}}{\text{run}}$ |
| 7(b)(ii) | $y = -0.5x + 2$ oe | 1FT | FT their gradient |
| 7(b)(iii) | $y = -0.5x + 3$ oe | 2FT | B1FT for $y = -0.5x + k$ oe, $k \neq 2$ or B1 for $y = mx + 3$ oe, $m \neq -0.5$ or 0 |
| 8(a)(i) | Correct trapezium | 2 | M1 for $AB = 8$ cm and $BC = 6$ cm or AB and DC perpendicular to AD |
| 8(a)(ii) | 124 | 1FT | FT their obtuse angle at C (or B) |
| 8(a)(iii) | 4.7 | 1FT | FT their CD |
| 8(a)(iv) | 31.25 to 32.25 | 2 | M1 for $0.5 \times 5 \times (8 + \text{their (iii)})$ oe |
| 8(b)(i) | 17700 or 17671 to 17674 | 3 | M2 for $\pi \times 15^2 \times 25$ or B1 for 15 seen If zero scored, SC1 for answer 70700 or 70685 to 70695 or 22500π |
| 8(b)(ii) | 4800 | 3 | M2 for $2 \times 30 \times 30 + 4 \times 30 \times 25$ oe or better or M1 for 30×30 and 30×25 or B1 for cuboid 30 by 30 by 25 soi |
| 9(a) | $y(y + 8)$ final answer | 1 | |
| 9(b) | $2x + 17$ final answer | 2 | B1 for $6x - 3$ or $-4x + 20$ or $2x + j$ or $kx + 17$ as final answer |
| 9(c) | $\frac{k - 5m}{7}$ oe final answer | 2 | M1 for $7p = k - 5m$ or $\frac{k}{7} = \frac{5m}{7} + p$ |
| 9(d) | Correctly equating one set of coefficients | M1 | |
| | Correct method to eliminate one variable | M1 | Dependent on the coefficients being the same for one of the variables. Correct consistent use of addition or subtraction using their equations. |
| | $x = 4$ | A1 | |
| | $y = -3$ | A1 | If zero scored, SC1 if no working shown, but 2 correct answers given or SC1 for 2 values satisfying one of the original equations. |