



Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

MATHEMATICS

0580/31

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) | 16 | 1 | |
| 1(a)(ii) | –15 | 1 | |
| 1(b)(i) | Friday | 1 | |
| 1(b)(ii) | 6 | 1 | |
| 1(c)(i) | 1605 or 405 pm | 1 | |
| 1(c)(ii) | 4 | 1 | |
| 2(a) | 180.5[0] | 3 | M2 for $3 \times 24 + 5 \times 12.50 + 46$ oe or M1 for 3×24 or 5×12.50 or better, soi by 72 or 62.5 |
| 2(b) | 69.12 | 2 | M1 for 64×1.08 oe |
| 2(c) | 12 | 3 | M2 for $(\frac{280}{250} - 1) \times 100$ or $\frac{280-250}{250} \times 100$ oe or M1 for $\frac{280}{250} - 1$ or $\frac{280}{250} \times 100$ or $\frac{280-250}{250}$ oe |
| 2(d) | 561 | 3 | M1 for 5.5×8.5 soi by 46.75 M1 for <i>their</i> 46.75×12 |
| 2(e) | 4287.66 | 3 | M2 for $3600 \times (1 + \frac{6}{100})^3$ oe or M1 for $3600 \times (1 + \frac{6}{100})^2$ oe soi by 4044.96 If zero scored, SC2 for 687.6576, 687.658, 687.66, 687.65, 687.7, 688 or 690 |

| Question | Answer | Marks | Partial marks |
|-------------|---|-------|---|
| 3(a)(i) | Written test and a valid reason | 1 | |
| 3(a)(ii) | Positive | 1 | |
| 3(a)(iii) | (45,10) indicated | 1 | |
| 3(a)(iv) | 42 | 1 | |
| 3(b)(i) | 29 | 2 | M1 for 6 in the correct order, 8 14 17 21 23 29... or ... 29 30 32 39 41 48 |
| 3(b)(ii) | 27.5 or 27.45 to 27.46 | 2 | M1 for all 11 numbers added, allowing one error or omission, and divided by 11 |
| 4(a)(i) | Correct point plotted | 1 | |
| 4(a)(ii) | Right-angled or scalene | 1 | |
| 4(a)(iii) | 8 4 | 1 | |
| 4(a)(iv)(a) | 0.5 oe | 2 | M1 for attempt at rise \div run |
| 4(a)(iv)(b) | [y =] 0.5x oe | 1FT | Correct or FT <i>their (iv)(a)</i> |
| 4(b)(i) | ...1 ...-5 -5...1 15 | 3 | B2 for 3 or 4 correct or B1 for 1 or 2 correct |
| 4(b)(ii) | Correct curve | 4 | B3FT for 8 or 9 points correctly plotted or B2FT for 6 or 7 points correctly plotted or B1FT for 4 or 5 points correctly plotted |
| 4(b)(iii) | -2.8 1.8 | 2FT | B1FT for each |
| 5(a) | 51.6 | 2 | B1 for 4.3[cm] |
| 5(b) | [0]47 | 1 | |
| 5(c) | 292 | 1 | |
| 5(d)(i) | Arc centre A radius 7 cm | 1 | |
| | Arc centre C radius 3.5 cm | 1 | |
| | One point marked at intersection of correct arcs | 1 | If zero scored, SC1 for any arc centred on A or C, or correct point marked with no arcs |
| 5(d)(ii) | 504 | 2 | M1 for $84 \div$ <i>their</i> time or 84×6 |
| 5(e) | 298 | 2 | M1 for $118 + 180$ oe |

| Question | Answer | Marks | Partial marks |
|-----------|--|-------|---|
| 6(a)(i) | 1, 2, 3, 6, 9, 18 only | 2 | B1 for 4 or 5 correct factors and no extras or 6 correct with one extra |
| 6(a)(ii) | Any multiple of 30 | 1 | |
| 6(a)(iii) | 46.2 | 1 | |
| 6(a)(iv) | 15.625 | 1 | |
| 6(a)(v) | 5 | 1 | |
| 6(b) | $2^3 \times 3^2$ | 2 | M1 for a complete factor tree or 2, 2, 2, 3, 3 clearly identified as factors |
| 6(c) | 240 | 2 | M1 for [16=] 2^4 or $2 \times 2 \times 2 \times 2(\times 1)$ or [30=] $2 \times 3 \times 5(\times 1)$ or lists of multiples of both at least up to 240, or any product that equals 240 or B1 for $240n$ |
| 6(d) | 2000 or 8 pm | 3 | M1 for [LCM of 6 and 9 =] 18(00) or M1 for lists of multiples B1FT for “2 am” + <i>their</i> 18 correctly worked out soi OR B2 for [clock A = 2] 8, 14, 20... and [clock B = 2] 11, 20... or B1 for [clock A = 2] 8, 14, 20...or [clock B = 2] 11, 20... |
| 7(a)(i) | $\frac{6}{20}$ oe | 1 | |
| 7(a)(ii) | $\frac{5}{20}$ oe | 1 | |
| 7(a)(iii) | 0 | 1 | |
| 7(b) | [0].28 oe | 2 | M1 for $1 - 0.3 - 0.24 - 0.18$ oe or $1 - 0.72$ oe |
| 7(c) | $\frac{8}{20}$ | 1 | Accept $8 \div 20$ |
| | $\frac{6}{15}$ | 1 | Accept $6 \div 15$ |
| | Comparing the two fractions with equal denominators or as decimals | 1 | e.g. $\frac{8}{20} = \frac{24}{60}$ and $\frac{6}{15} = \frac{24}{60}$ or both shown equal to $\frac{2}{5}$ or [0] .4 or 40% |

| Question | Answer | Marks | Partial marks |
|------------|--|-------|--|
| 8(a) | $8x + 7$ final answer | 2 | B1 for $10x + 15$ or $-2x - 8$ or $8x + j$ or $kx + 7$ as final answer |
| 8(b)(i) | $6x$ final answer | 1 | |
| 8(b)(ii) | $5a$ final answer | 1 | |
| 8(c) | $10y + 12$ or $2(5y + 6)$ final answer | 3 | M1 for $2(3y + 1) + 2(2y + 5)$ oe B1 for $10y + j$ or $ky + 12$ ($k \neq 0$) |
| 8(d) | $7(m + 6) + 3m = 182$ or $7m + 42 + 3m = 182$ | 2 | B1 for $m + 6$ or $7t + 3m = 182$ |
| | 14 | 3 | M1 for $7m + 42$ [$+ 3m = 182$] M1 for $7m + 3m = 182 - 42$ or better OR M2 for $[m=] (182 - (6 \times 7)) / (7 + 3)$ or better or M1 for $182 - (6 \times 7)$ or better |
| 9(a)(i) | 7.5 | 2 | M1 for $\frac{1}{2} \times 5 \times 3$ or evidence of counting squares |
| 9(a)(ii) | Correct enlargement | 2 | B1 for one line correctly scaled |
| 9(b)(i) | Rotation [centre] (0,0) oe 180° | 3 | B1 for each |
| 9(b)(ii) | Correct reflection with points (-3,-3), (-1,-5) and (-6,-6) | 2 | B1 for reflection in $y = k$ or $x = -1$ |
| 9(b)(iii) | Correct translation with points (4,4), (2,2) and (-1,5) | 2 | B1 for a correct horizontal translation (5 to the right) or a correct vertical translation (1 up) |
| 10(a)(i) | 30 | 1 | |
| 10(a)(ii) | add 8 oe | 1 | |
| 10(a)(iii) | $8n - 10$ oe final answer | 2 | B1 for $8n + j$ or $kn - 10$ ($k \neq 0$) |
| 10(b) | 9 | 1 | |
| 10(c) | 34 | 1 | |