## CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

## MARK SCHEME for the May/June 2015 series

## 0580 MATHEMATICS

0580/33
Paper 3 (Core), maximum raw mark 104

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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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 | Mark | Part marks |
| :---: | :---: | :---: | :---: |
| (i) <br> (ii) <br> (iii) <br> (iv) <br> (b) <br> (i) <br> (ii) <br> (iii) | $\begin{aligned} & 2,1,3,5,4,3,2 \\ & 13 \\ & 13.25 \\ & 2350 \text { cao } \\ & 16 \\ & 6 \\ & \text { one correct comment } \end{aligned}$ |  | M1 for 4 correct frequencies or all tallies correct and frequency column blank or for all frequencies correct in tally column <br> M1FT for attempt at their $\Sigma(x f) \div 20$ <br> examples; <br> Mode for Sparke(16) greater than mode for Pherlak(13) ; <br> the range is the same for both; the mean is the same for both [13.25]; the total [number of trains] is the same [265]; median for Sparke(13.5) greater than median for Pherlak(13) |
| 2 (a) <br> (b) (i) <br> (ii) <br> (c) (i) <br> (ii) <br> (iii) | equilateral <br> isosceles <br> right-angled or scalene <br> 40 <br> 86 <br> $\mathrm{cm}^{2}$ <br> angle [in a] semi-circle [=90] <br> 14.8 <br> 56.0 to 56.144 | $2$ | B1 for each <br> M1 for $8 \times 12-2 \times 5$ oe B1indep for $\mathrm{cm}^{2}$ <br> accept any correct equivalent statement <br> M2 for $\sqrt{16^{2}-6^{2}}$ oe or better or M1 for $A C^{2}+6^{2}=16^{2}$ or better <br> M2 for $\pi \times 8^{2} \div 2$ oe or M1 for $\pi \times 8^{2}$ <br> M1 for $6 \times$ their $(\mathbf{c})(\mathbf{i i}) \div 2$ oe or $44.4[\ldots]$ <br> M1dep for the area of their semi-circle - the area of their triangle |


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| Question | Answer | Mark | Part marks |
| :---: | :---: | :---: | :---: |
| 3 <br> (a) <br> (i) <br> (ii) <br> (b) <br> (c) | $76,124$ <br> pie chart with two correct sectors <br> $\frac{4}{15}$ final answer cao $72$ | 2 1 2 2 | B1 for each or SC1 for two angles adding to 200 <br> FT their table providing two angles adding to 200 <br> M1 for $\frac{96}{360}$ or $\frac{24}{90}$ isw oe <br> M1 for $\frac{405 \times 64}{360}$ or $\frac{405 \times 16}{90}$ oe |
| 4 (a) <br> (b) <br> (c) <br> (d) | lines $A C$ and $B C$ correct and with correct arcs correct bisector with two pairs of correct arcs <br> 5.9 to 6.3 <br> 119 to 123 | 2 <br> 2FT <br> 1FT <br> 1FT | B1 for one of their lines the correct length or correct triangle no arcs <br> M1FT for correct line without arcs or two pairs of correct arcs |
| 5 (a) | $47200$ | 3 | M2 for $40000+\frac{40000 \times 3.6 \times 5}{100}$ or M1 for $\frac{40000 \times 3.6 \times 5}{100}$ or 7200 |
| (b) | 443.8[0] cao | 1 |  |
| (c) | $142$ | 3 | M2 for $24 \times 1.25+32 \times 3.5$ or $30+112$ or M1 for either $24 \times 1.25$ or $32 \times 3.5$ or 30 or 112 |
| (d) | $\begin{aligned} & 45 \\ & 30 \\ & 105 \end{aligned}$ | 3 | M2 for 3 (or 2 or 7 ) $\times \frac{180}{3+2+7}$ or better or M1 for $\frac{180}{3+2+7}$ or better <br> If zero scored <br> $\mathbf{S C 2}$ for the correct answers in the incorrect places |
| (e) <br> (f) | $\begin{aligned} & 52.5 \\ & 8 \times 20=160 \end{aligned}$ | 2 | M1 for 2 of $8[\mathrm{~h}] 45[\mathrm{~m}], 9[\mathrm{~h}] 30[\mathrm{~m}]$ and $8[\mathrm{~h}]$ oe <br> B1 for 8 or 20 seen |


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| Question | Answer | Mark | Part marks |
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| 6 (a) <br> (b) <br> (c) <br> (d) <br> (e) <br> (i) <br> (ii) <br> (f) | 092010002050points ( 0950,125 ) and ( 1140,0$)$ <br> plotted and joined with a ruled <br> continuous line1040 to 105056.28 final answer cao | 1 <br> 1 <br> 3 <br> 1 <br> 1FT <br> 1 | M1 for use of $125 \div$ their time <br> B1 for time $=2.5$ <br> FT their line |
| 7 (a) <br> (b) (i) <br> (ii) <br> (iii) | $-1$ $16 \ldots-2 \ldots-2 \ldots 16$ <br> 10 points correctly plotted Correct smooth curve <br> Strict FT their intersection | 1 <br> 2 <br> 4 <br> 2FT | B1 for 2 correct <br> B3FT for 9 or 10 points correctly plotted <br> B2FT for 7 or 8 points correctly plotted <br> B1FT for 5 or 6 points correctly plotted <br> B1 for one correct value |
|  | 394.1 cao <br> $7 a-4 b$ final answer <br> 18 <br> 11 $\begin{aligned} & {[x=] 5} \\ & {[y=]-2} \end{aligned}$ <br> Working must be shown |  | M1 for $394[\ldots]$ or $4 \times \pi \times 5.6^{2}$ <br> B1 for either $7 a$ or $-4 b$ in their final answer <br> M1 for correctly equating one set of coefficients <br> M1 for correct method to eliminate one variable <br> A1 for $[x=] 5$ <br> A1 for $[y=]-2$ <br> If zero scored SC1 for 2 values satisfying one of the original equations <br> SC1 if no working shown but 2 correct answers |


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| Question | Answer | Mark | Part marks |
| :---: | :---: | :---: | :---: |
| (a) (i) <br> (ii) <br> (iii) <br> (iv) <br> (b) (i) <br> (ii) | 17 <br> add 3 or +3 <br> $3 n+2$ oe as final answer <br> 300 is in the 3 times table [and all the terms are 1 less or 2 more than the 3 times table] <br> $22 \quad 29$ <br> the difference increases by one each time | 2 <br> 2 | B1 for $3 n+k$ or $j n+2(j \neq 0)$ accept any correct reason <br> B1 for either correct or SC1 for a difference between the two terms of 7 accept any correct explanation |
| 10 (a) <br> (b) <br> (c) <br> (d) <br> (e) | three correct points <br> correct ruled continuous line of best fit <br> negative <br> 2.25 to 2.30 <br> 460 to 560 | $1$ | B1 for two correct points <br> FT their straight line of best fit if negative <br> FT their straight line of best fit if negative |
| 11 (a) <br> (b) <br> (c) (i) <br> (ii) | correct reflection, points at $(1,-4),(4,-4)$ and $(1,-5)$ <br> correct translation, points at $(-4,2),(-1,2)$ and $(-4,3)$ <br> rotation <br> [centre] $(0,0)$ oe <br> $90^{\circ}$ (anti-clockwise) oe <br> enlargement <br> [centre] $(-4,-1)$ <br> [sf] 2 | 3 | B1 for reflection in $y=k$ <br> B1 for translation $\binom{-5}{k}$ or $\binom{k}{4}$ <br> B1 for each part <br> B1 for each part |

