## GCSE

## Mathematics B (MEI) (Two Tier)

## General Certificate of Secondary Education GCSE J519

## Mark Schemes for the Units

## January 2010

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## MARK SCHEMES FOR THE UNITS

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## Mark Scheme

## B291 (Foundation - Modular) Paper 1

If answers clearly come from totally incorrect working, do not award the marks.

| 1 | (a) | 30000000 | 1 |  |
| :---: | :---: | :---: | :---: | :---: |
|  | (b) | (i) 8490 <br> (ii) 8500 | 1 <br> 1 |  |
| 2 | (a) | (i) $\frac{3}{4}$ <br> (ii) 2 rectangles shaded | $1$ $1$ |  |
|  | (b) | Rings round $\frac{2}{8}, \frac{10}{40}$ | 2 | B1 for one correctly ringed + no extras, or two right + one extra |
| 3 |  | chord, sector <br> radius <br> centre <br> circumference | 1 1 1 1 |  |
| 4 |  | 9:45 oe | 3 | B2 for $2 \frac{1}{4}, 2 \mathrm{~h} 15 \mathrm{~m}$ seen or $7.30+1 \mathrm{~h} 45+30 \mathrm{~m}$, or better or all correct with one arithmetic error SC2 for 9:10, 9.30 or 10.00 <br> B1 for $1 \frac{3}{4}$ or 1 h 45 m seen or 135 m <br> SC1 for $1 \mathrm{~h} 40,2 \mathrm{~h}, 2 \mathrm{~h} 30$ or $9: 05$, seen or $7.30+3 \times 35+2 \times 15$ oe |
| 5 | (a) | (i) $(x=) 3$ <br> (ii) $(y=) 9$ | $1$ |  |
|  | (b) | 28 | 2 | B1 for 12 or 16 seen |
|  | (c) | -12 | 1 |  |
| 6 | (a) | Fifty thousand, 50 thousand, 50000 | 1 |  |
|  | (b) | 4 | 1 |  |
|  | (c) | $\begin{aligned} & \text { (i) } 40 \\ & \text { (ii) } 48 \end{aligned}$ | 1 |  |


|  | (d) | $250 \times 60 \times 50$ <br> 750000 <br> $\mathbf{m}^{3}$ | M1 <br> A1 <br> B1 | figs 75 |
| :--- | :--- | :--- | :--- | :--- |
|  | (e) | $70 \times \frac{8}{5}$ <br> 112 | M1 <br> A1 | Or list of equivalents as far as 70 |
| $\mathbf{7}$ | (a) | Suitable labels <br> indication of numbers | $\mathbf{1}$ | Must have list of at least 2 types of <br> vehicles <br> tally and/or frequency oe |
|  | (b) | Leading question oe | $\mathbf{1}$ |  |
| (c) | Vary location <br> Vary time | $\mathbf{1}$ |  |  |
| $\mathbf{8}$ | (a) | $n=\frac{m+3}{5}$ oe | $\mathbf{2}$ | $\mathbf{M 1}$ for $m+3=5 n$ or $\quad \frac{m}{5}=n-\frac{3}{5}$ |
| $\mathbf{n C 1}$ for $n=\frac{m-3}{5} \quad$ or $m+3 \div 5$ or |  |  |  |  |
| $m+\frac{3}{5}$ |  |  |  |  |

## SECTION B

| 9 | (a) | $\begin{array}{lll} \hline 4 \\ 20 \\ \ddots & & \\ 6 & \ddots & \ddots \end{array}$ | $\begin{aligned} & 1 \\ & 1 \\ & 1 \\ & 1 \end{aligned}$ | FT from key where possible |
| :---: | :---: | :---: | :---: | :---: |
|  | (b) | mode 8 median 7 | $\begin{aligned} & \hline \text { B1 } \\ & \text { B2 } \end{aligned}$ | If B0 earned for median, B1 for 3567788814 |
| 10 | (a) | (i) 24 <br> (ii) 20 | $\begin{aligned} & 1 \\ & 1 \end{aligned}$ |  |
|  | (b) | 7 | 1 |  |
| 11 |  | $\begin{aligned} & 6 \text { bulbs } \\ & 10 \mathrm{p} \end{aligned}$ | $\begin{aligned} & 2 \\ & 1 \end{aligned}$ | M1 for $10 \div 1.65$ oe |
| 12 | (a) | C | 1 | or 0.5 |
|  | (b) | E <br> Suitable explanation. | $\begin{aligned} & 1 \\ & 1 \end{aligned}$ | or 1 |
| 13 | (a) | (i) 23.1 <br> (ii) 35.8 | $\begin{aligned} & 1 \\ & 1 \end{aligned}$ |  |
|  | (b) | (i) 7921 <br> (ii) 3.9 cao <br> (iii) 8 cao | $\begin{aligned} & 1 \\ & 1 \\ & 1 \end{aligned}$ |  |
| 14 | (a) | 11 | 1 |  |
|  | (b) | 1 | 1 |  |
|  | (c) | 2 | 2 | M1 for +1 or $\div 4$ soi SC1 for 2.75 |
| 15 | (a) | $-3,1$ | 1 |  |
|  | (b) | Points plotted Line drawn | $\begin{gathered} 1 \mathrm{ft} \\ 1 \end{gathered}$ |  |
|  | (c) | Correct line | 1 |  |

\(\left.$$
\begin{array}{|l|l|l|l|l|}\hline \mathbf{1 6} & & \begin{array}{l}\text { ldea of area, soi } \\
25(\pi) \text { or 100 or } 78 \text { to } 79 \\
56.25(\pi) \text { or } 225 \text { or } 176 \text { to } 177 \\
\begin{array}{l}\text { Supporting words or numerical } \\
\text { evidence. }\end{array}\end{array} & \begin{array}{l}\text { M1 } \\
\text { A1 } \\
\text { A1 }\end{array}
$$ \& A1 A1 A1\left(\frac{15}{10}\right)^{2}=2.25>2 <br>

A1 So good value\end{array}\right\}\)| A1 |
| :--- |

## B292 (Foundation - Modular) Paper 2

If answers clearly come from totally incorrect working, do not award the marks.
SECTION A

| 1 |  | $\begin{aligned} & \text { Europe } \\ & 35 \\ & 220 \\ & 293 \end{aligned}$ | $\begin{gathered} 1 \\ 1 \\ 1 \\ 1 \mathrm{ft} \end{gathered}$ |  |
| :---: | :---: | :---: | :---: | :---: |
| 2 | (a) <br> (b) <br> (c) | $\begin{aligned} & 50 \\ & \frac{1}{4} \text { oe } \\ & 0.75 \end{aligned}$ | $\begin{aligned} & 1 \\ & 1 \\ & 1 \end{aligned}$ |  |
| 3 | (a) <br> (b) | Train A 2 hr 02 min $150$ | $\begin{gathered} 1+1 \\ 2 \end{gathered}$ | If Zero, M1 for any correct train time seen M1 for $300 \div 2$ |
| 4 | (a) <br> (b) <br> (c) <br> (d) | $\begin{aligned} & \frac{3}{4} \\ & 1 \frac{3}{4} \text { isw } \\ & 2000 \times 14 \\ & 28000 \\ & 27 \end{aligned}$ | 1 <br> 1 <br> M1 <br> A1 <br> 2 | accept any from 2000/2300 $\times 10 / 14 / 15$... .with matching correct answer $\mathbf{M 1}$ for $30 \times 0.9$ oe or for ' $10 \%$ is $3^{\prime}$ |
| 5 | (a) <br> (b) <br> (c) <br> (d) | $\begin{aligned} & 20 \\ & 50 \\ & 1 \\ & 70 \end{aligned}$ | $\begin{aligned} & 1 \\ & 1 \\ & 1 \\ & 2 \end{aligned}$ | M1 for $7 \times(9+1)$ <br> SC1 for ' $7 \times(6+1)=49$ ' seen |


| 6 | (a) <br> (b) | $\begin{aligned} & \hline \frac{1}{5} \\ & 0.6 \text { oe } \end{aligned}$ | $3$ | M2 $\frac{40}{200}$ oe fraction, decimal or percent M1 for any/200, or 40/(x>160) |
| :---: | :---: | :---: | :---: | :---: |
| 7 | (a) <br> (b) <br> (c) | $\text { (3.40) } 3.804 .20 \text { (4.60) } 5.00$ <br> Points correctly plotted <br> discrete data | $\begin{gathered} 2 \\ 2 \mathrm{ft} \\ 1 \end{gathered}$ | M1 for 2 correct (allow ft) $+/-1 \mathrm{~mm}$ <br> B1 for 4 points correct. <br> eg 'Can't have 1.5 toppings' <br> or 'Can't have $£ 4$ charged' |
| 8 | (a) <br> (b) <br> (c) <br> (d) <br> (e) | $\begin{aligned} & \hline \text { diagram } \\ & 3 \\ & 1,(2), 3,4,5 \\ & \text { 'goes up by } 1 \text { each time' } \\ & 11 \\ & n-1 \text { oe } \end{aligned}$ | $\begin{gathered} \hline 1 \\ 1 \mathrm{ft} \\ 2 \\ \\ 1 \\ 1 \\ 1 \end{gathered}$ | ft from correct 2 by $n$ diagram ( $n \neq 2,3$ ) <br> M1 for 3 correct, <br> or for another correct diagram seen or $c=n-1$ in words |
| 9* | (a) <br> (b) <br> (c) <br> (d) <br> (e) | 8.8 and 7.6 <br> plot points. +/-1mm accuracy (strong) positive (correlation) ruled, single line drawn <br> (from their graph) | 1 2 1 1 dep <br> 1 | cao <br> Give B1 for 3 or 4 correct <br> line through ( $6.7,5.4$ to 5.8 ); line must have at least 4 points above (or on) and below (or on) it; line must extend over $x$ - range of points. dep at least 1 mark for (b) dep straight line with positive gradient |
| 10* | (a) <br> (b) | correct arrow $x<6 \text { isw }$ | $\begin{aligned} & 1 \\ & 2 \end{aligned}$ | accept $x>-2$ <br> M1 for $2 x<12$ |
| 11* |  | $x=5$ | 3 | M1 for $5 x+3=4 x+8$ then $\mathbf{M 1}$ for $5 x$ - their ' $4 x$ ' or 8 - their ' 3 ' on one side of equation |

## SECTION B

| 12 | (a) (b) (c) | point marked freehand parallel freehand perpendicular |  |  | $\begin{aligned} & 1 \\ & 1 \\ & 1 \end{aligned}$ | +/- 2 mm |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 13 | (a) (b) (c) | Parallelogram Rectangle Trapezium |  |  | $\begin{aligned} & \hline 1 \\ & 1 \\ & 1 \end{aligned}$ |  |
| 14 | (a) <br> (b) <br> (c) <br> (d) <br> (e) <br> (f) | mediu <br> could <br> sm <br> med <br> $\lg$ <br> $\mathrm{v} \lg$ <br> Add fr <br> if its16 <br> correc <br> 4 equa <br> (their) <br> Mediu | edium or 11 <br> 111111 <br> 1111 <br> 11 <br> ncy colum <br> lled axes th bars ect heights | arge <br> 2 <br> 7 <br> 5 <br> 2 | $\begin{gathered} \hline 1 \\ 1 \\ 2 \\ 2 \\ \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \mathrm{ft} \\ 1 \end{gathered}$ | M1 for just 1 column, or for 1 error <br> accept reversed axes ignore gaps or their absence accept freehand accept '53-63' |
| 15 | (a) <br> (b) | $6800$ |  |  | $3$ $2$ | M1 for $10 \times 8 \times 5$ (=400) <br> M1 dep for $\times 17$ if at least one of first M1's products done <br> M1 for $1012 \div$ (their) 400 <br> SC1 for $1012 \div$ ( 40 or 6800 ) |
| 16 |  | 2800 |  |  | 3 | M1 for $2500 \times 3 \times 4$ <br> M1dep for $\div 100(=300)$ if $x 4$ seen <br> ALT M2 for 300 www <br> M1 for 'their 4\% of 2500' x 3 Or for $12 \%$ seen |


| 17 | (a) <br> (b) | small <br> 4 lots cost $£ 7.92$ soi <br> 10.85 (miles/litre) soi 10.41 (miles/litre) soi Car A. | $\begin{gathered} 1 \\ 1 \\ \text { indep } \end{gathered}$ <br> M2 A1 | ALT: $7.95 \div 4=1.987$.. or both of '100 $\div 1.98=50.50 . .1 / 400 \div 7.95=50.31^{\prime}$ <br> all seen, or equiv comparison. M1 for one unitary calculation seen. |
| :---: | :---: | :---: | :---: | :---: |
| 18* | (a) <br> (b) | ```\(48^{\circ}\) b .....a.... alternate angles ... (angles on a) straight line``` | $\begin{aligned} & 1 \\ & 1 \\ & 1 \\ & 1 \end{aligned}$ | condone ' $T$ ' and 'S' condone $Z$ angles |
| 19* | (a) <br> (b) <br> (c) | Rotation through $90^{\circ}$ anti-clockwise about origin correct translation correct reflection | $\begin{aligned} & 1 \\ & 1 \\ & 1 \\ & 2 \\ & 2 \end{aligned}$ | M1 for any translation correct in $x$ or $y$ direction <br> M1 for any reflection in $x=k$ |
| 20 | (a) <br> (b) | $\begin{aligned} & \hline 1600 \\ & 1.25 \end{aligned}$ | $\begin{aligned} & \hline 2 \\ & 3 \end{aligned}$ | M1 for $2400 \div 1.5$ <br> M1 for 3000 (g) seen www M1 for (their) $3000 \div 2400$ |
| 21* | (a) <br> (b) <br> (c) | $-3 \ldots 5$ <br> 5+ points plotted correctly smooth parabolic curve through points $x=4.2$ | $\begin{gathered} \hline 1 \\ \mathbf{1 f t} \\ \mathbf{1} \\ 1 \end{gathered}$ | $\text { to }+/-1 \mathrm{~mm}$ <br> allow 4.1 to 4.3 |
| 22 | (a) <br> (b) | $\begin{aligned} & 60600000 \\ & 5400 \end{aligned}$ | $\begin{aligned} & 1 \\ & 1 \end{aligned}$ |  |

## B293 (Higher - Modular) Paper 3

If answers clearly come from totally incorrect working, do not award the marks.

## SECTION A

| 1 | (a) | $\text { (i) } \frac{5}{12}$ | 2 | M1 for sight of LCM |
| :---: | :---: | :---: | :---: | :---: |
|  |  | (ii) $\frac{1}{6}$ | 2 | M1 for sight of 4 in denominator and not in numerator $\text { (soi by } \frac{2}{12} \text { ) }$ |
|  | (b) | $\begin{aligned} & \approx \frac{20 \times 30}{300} \\ & \approx 2 \end{aligned}$ | M1 <br> A1 | For sight of at least two numbers rounded correctly |
| 2 | (a) | Suitable labels indication of numbers | $\begin{aligned} & 1 \\ & 1 \end{aligned}$ | Must have list of at least 2 types of vehicles tally and/or frequency oe |
|  | (b) | Leading question oe | 1 |  |
|  | (c) | Vary location vary time | $\begin{aligned} & 1 \\ & 1 \end{aligned}$ |  |
| 3 | (a) | 1 9 9     <br> 2 0 1 2 3 3  <br> 5 6 7 7 7 8 9 <br> 3 1 1 3 4 7  <br> 4 1      <br> Key 1\| 9 means 19 | 3 | B1 for correct branches B1 for leaves in correct order <br> B1 Correct key |
|  | (b) | 27 | 1 |  |
| 4 | (a) | $\Rightarrow n=\frac{m+3}{5} \text { oe }$ | 2 | M1 for $m+3=5 n$ or $\frac{m}{5}=n-\frac{3}{5}$ $\mathbf{S C} \mathbf{1}$ for $n=\frac{m-3}{5}$ or $m+3 \div 5$ or $m+\frac{3}{5}$ |
|  | (b) | $p^{8}$ | 1 |  |
|  | (c) | ( $x=$ ) $\frac{17}{2}$ or $8 \frac{1}{2}$ or 8.5 | 3 | M1 for attempt to clear fractions (eg $2 x-5$ $=3 \times 4$ ) <br> M1 for collecting terms |


| 5 |  | 3.6 www | 3 | $\mathbf{M 1} \frac{Q R}{6}=\frac{4.8}{8}=0.6$ <br> A1 $Q R=0.6 \times 6$ <br> Or: <br> M1 sf $\frac{6}{8}: \quad$ A1 $4.8 \times \frac{6}{8}$ |
| :---: | :---: | :---: | :---: | :---: |
| 6 | (a) | $(n-1)+n+(n+1)=3 n$ <br> So is always a multiple of 3 | $\begin{aligned} & \hline \text { B1 } \\ & \text { B1 } \end{aligned}$ |  |
|  | (b) | $\text { (i) } \begin{aligned} & (n-1)^{2}+n^{2}+(n+1)^{2} \\ & =n^{2}-2 n+1+n^{2}+n^{2}+ \\ & 2 n+1 \\ & =3 n^{2}+2 \end{aligned}$ | M1 <br> A1 <br> A1 | Multiply at least one bracket <br> At least one bracket correctly multiplied |
|  |  | (ii) $3 n^{2}$ is a multiple of 3 . So $3 n^{2}+2$ is always 2 more than a multiple . So no. | $\begin{aligned} & \text { M1 } \\ & \text { A1 } \end{aligned}$ | MOAO if no explanation <br> Or: <br> B1 one correct counter-example <br> B1 Conclusion |
| 7 | (a) | $(x+2)^{2}-11$ | 2 | B1 $(x+2)^{2}$ seen |
|  | (b) | (i) -11 <br> (ii) $x=-2 \pm \sqrt{11}$ | $\begin{aligned} & 1 \\ & 2 \end{aligned}$ | M1 $(x+2)^{2}=11 \mathrm{ft}$ <br> Or: Substitute in correct formula |

## SECTION B



|  | (c) | $-1.9,0.3,1.5$ | $\mathbf{2}$ | $\mathbf{B 1}$ for 2 correct |
| :--- | :--- | :--- | :--- | :--- |
| $\mathbf{1 6}$ | (a) | 14.59 | $\mathbf{2}$ | $\mathbf{M 1}$ sub in correct formula |
|  | (b) | (i) 58.4 |  |  |
| (ii) $151-152$ |  |  |  |  |$\quad \mathbf{1}$| Allow $4 \times$ their (a) $\mathbf{f t}$ |
| :--- |

## B294 (Higher - Modular) Paper 4

## SECTION A

| 1 | (a) | Triangle ACD with arcs Triangle ABC with arcs | $\begin{gathered} 2 \\ \mathrm{ft} 2 \end{gathered}$ | $\pm 2 \mathrm{~mm}$ throughout <br> B1 for triangle ACD without arcs <br> ft B1 for triangle ABC without arcs |
| :---: | :---: | :---: | :---: | :---: |
|  | (b) | Angle bisector of $\angle \mathrm{D}$ with arcs | ft 2 | $\pm 2^{\circ} \mathrm{ft}$ from part (a) B1 for angle bisector no arcs |
| 2 | (a) | 8.8 and 7.6 | 1 | cao |
|  | (b) | plot points. +/-1mm accuracy | 2 | Give B1 for 3, 4 correct |
|  | (c) | (strong) positive (correlation) | 1 |  |
|  | (d) | ruled, single line drawn | 1dep | line through (6.7, 5.4 to 5.8 ); line must have at least 4 points above (or on) and below (or on) it; line must extend over $x$ - range of points. dep at least 1 mark for (b) |
|  | (e) | (from their graph) | 1 | dep straight line with positive gradient |
| 3 | (a) | correct arrow | 1 | $\operatorname{accept} x>-2$ |
|  | (b) | $x<6$ | 2 | M1 for $2 x<12$ |
| 4 | (a) | 30 | 2 | B1 for $2 \times 3 \times 5$ or SC1 for 6 or 10 or 15 |
|  | (b) | 2700 | 2 | B1 for $2^{2} \times 3^{3} \times 5^{2}$ or SC1 for 2700k |
| 5 |  | $x=5$ | 3 | M1 for $5 x+3=4 x+8$ then M1 for $5 x$ - their ' $4 x$ ' or 8 - their ' 3 ' on one side of equation |
| 6 | (a) | $1.5 \times 10^{4}$ | 2 | M1 for $4.5 \times 10^{9} \div 3 \times 10^{5}$ soi by figs 1.5 |
|  | (b) | $4.35 \times 10^{9}$ | 2 | B1 for figs 4.35 |
| 7 | (a) | (i) $\mathrm{R}-\mathrm{R} R$ - | 2 | B1 for 4 correct |
|  |  | (ii) (prime) factors other than 2 and 5 | 1 | accept alternative eg 3 and 7 are factors |
|  | (b) | $\frac{72}{99} \text { or } \frac{24}{33} \text { or } \frac{8}{11}$ | 2 | M1 100r $=72.7272 \ldots \ldots$. oe |


| 8 | (a) | Women older oe Women greater spread oe | $\begin{aligned} & \hline 1 \\ & 1 \end{aligned}$ |  |
| :---: | :---: | :---: | :---: | :---: |
|  | (b) | 18 www | 3 | M1 for $20 \times 1.4$ to 1.6 M1 for $\quad-20 \times 0.6$ |
|  | (c) | 26 www | 2 | B1 for 25-27 |
| 9 | (a) | $\frac{4}{7} \mathbf{a}+\frac{3}{7} \mathbf{b}$ | 3 | $\begin{aligned} & \text { M2 for } \mathbf{a}+\frac{3}{7}(\mathbf{b}-\mathbf{a}) \text { or } \mathbf{b}+\frac{4}{7}(\mathbf{a}-\mathbf{b}) \\ & \text { M1 } \frac{3}{7} \text { or } \frac{4}{7} \text { seen } \end{aligned}$ |
|  | (b) | $\mathbf{a}+\frac{n}{n+1}(\mathbf{b}-\mathbf{a})$ oe | 3 | M1 for $\frac{n}{n+1}$ or $\frac{1}{n+1}$ <br> $+\mathbf{M 1}$ for $\mathbf{a}+\left(\right.$ their $\left.\frac{n}{n+1}\right)(\mathbf{b}-\mathbf{a})$ <br> or $\mathbf{b}+\left(\right.$ their $\left.\frac{1}{n+1}\right)(\mathbf{a}-\mathbf{b})$ |
| 10 | (a) | $x^{3}$ www | 2 | B1 for $x^{2.5}$ oe or $\sqrt{x^{6}}$ or $(\sqrt{ } \mathrm{x})^{6}$ seen |
|  | (b) | $\begin{aligned} & y(c x+d)=a x+b \\ & c x y-a x=b-d y \\ & x(c y-a)=b-d y \\ & x=\frac{b-d y}{c y-a} \text { oe } \end{aligned}$ | $\begin{gathered} 1 \\ \text { M1 } \\ \text { M1 } \\ 1 \end{gathered}$ | mark on intention attempt to multiply brackets and isolate $x$ terms factorising isolated $x$ terms |

## SECTION B

| 11 | (a) | Rotation through $90^{\circ}$ anti-clockwise about origin | $\begin{aligned} & \hline 1 \\ & 1 \\ & 1 \end{aligned}$ |  |
| :---: | :---: | :---: | :---: | :---: |
|  | (b) | correct translation | 2 | M1 for any translation correct in $x$ or $y$ direction |
|  | (c) | correct reflection | 2 | M1 for any reflection in $x=k$ |
|  | (d) | $\begin{aligned} & \binom{k}{5} \\ & x=\frac{1}{2} k+3 \end{aligned}$ | M1 <br> A1 | SC1 for $\binom{-4}{k} \begin{array}{r}\text { following reflection in } \\ y=-1 \text { in (c) }\end{array}$ |
| 12 | (a) | $b, a$ alternate angles angles on a straight line | $\begin{aligned} & 1 \\ & 1 \\ & 1 \end{aligned}$ | condone 'T' and 'S' condone $Z$ angles |
|  | (b) | (i) $2 p$ | 1 |  |
|  | (b) | (ii) 180 - their (i) oe | ft 1 | For ft their (i) must be $\mathrm{f}(\mathrm{p})$ |
| 13 | (a) | 34 www or 34.1 | 3 | M1 for $\frac{700-522}{522}$ or $700 \div 522$ <br> A1 for figs 340.9-341 or 1.34-1.341 Or SC1 for 25.4 (\%) |
|  | (b) | 360 | 3 | M2 for $522 \div 1.45$ oe M1 for $145 \%$ or 1.45 seen |
| 14 | (a) | $n^{2} \mathrm{oe}$ | 1 |  |
|  | (b) | $2 n+1$ oe | 2 | B1 for $2 n+k$ |
|  | (c) | $n^{2}+2 n+1$ oe | 1 ft | ft their (a) + their (b) provided both $\mathrm{f}(\mathrm{n})$. |
| 15 | (a) | -3 ... 5 | 1 |  |
|  | (b) | 5+ points plotted correctly smooth parabolic curve through points | $\begin{aligned} & 1 \\ & 1 \end{aligned}$ | to +/-1 mm |
|  | (c) | Correct ruled line $y=x-2$ <br> Strict ft their points of intersection. | 2 <br> 2 ft | B1 for table of values or at least 2 correct plots <br> strict $\mathrm{ft} \pm 1 / 2 \mathrm{sm} \mathrm{sq}$, B1 for each pair of coords. No ft from horizontal or vertical lines. |
| 16 | (a) | $\frac{35}{36}$ | 3 | M1 for $1 / 6 \times 1 / 6$ or $1 / 36$ + M1 for 1 - their ( $1 / 6 \times 1 / 6$ ) |


|  | (b) | 0.025 www cao | 3 | M2 for [their $(35 / 36)]^{4} \times$ their $(1 / 36)$ M1 for [their $(35 / 36)]^{n} \times$ their $(1 / 36)$ |
| :---: | :---: | :---: | :---: | :---: |
| 17 |  | 87.4 or <br> 87 following correct working | 4 | M2 for $x=(150 \sin 35) / \sin 100$ oe or M1 for $x / \sin 35=150 / \sin 100$ oe A1 for 87.36 . |
| 18 | (a) | circle <br> centre $(0,0)$ <br> radius $\sqrt{40}$ oe or 6.3. | $\begin{aligned} & \text { M1 } \\ & \text { A1 } \\ & \text { A1 } \end{aligned}$ | soi by coords at axes |
|  | (b) | $\begin{aligned} & x^{2}+(x-4)^{2}=40 \\ & x^{2}-8 x+16 \\ & 2 x^{2}-8 x-24(=0) \text { or } x^{2}-4 x-12(= \\ & 0) \\ & (x-6)(x+2) \text { oe } \\ & x=6 \text { or }-2 \\ & (6,2) \text { and }(-2,-6) \end{aligned}$ | M1 B1 A1 M1 <br> A1 1 ft | attempt to factorise their quadratic (so 2 terms correct) or subst in formula <br> ft their two $x$ values subst in $y=x-4$ |

## List of Abbreviations

The following abbreviations are commonly found in GCSE Mathematics mark schemes.

- Where you see cao in the mark scheme it means correct answer only.
- Where you see ft in the mark scheme it means follow through.
- Where you see oe in the mark scheme it means or equivalent.
- Where you see rot in the mark scheme it means rounded or truncated.
- Where you see seen in the mark scheme it means that the mark is earned if that number or expression is seen anywhere in the answer space, including on the answer line, even if it is not in the method leading to the final answer.
- Where you see soi in the mark scheme it means seen or implied.
- Where you see www in the mark scheme it means without wrong working.
- Where you see dep in the mark scheme it means dependent on.


## Grade Thresholds

General Certificate of Secondary Education
Mathematics B (MEI) (Two Tier) (J519)
January 2010 Examination Series

## Unit Threshold Marks

| Unit |  | Maximum <br> Mark | A* $^{*}$ | A | B | C | D | E | F | G | U |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| B291 | Raw <br> mark | 72 | N/A | N/A | N/A | 51 | 43 | 35 | 28 | 21 | 0 |
| B292 | Raw <br> mark | 100 | N/A | N/A | N/A | 67 | 55 | 43 | 31 | 19 | 0 |
| B293 | Raw <br> mark | 72 | 59 | 49 | 39 | 29 | 19 | 14 | N/A | N/A | 0 |
| B294 | Raw <br> mark | 100 | 71 | 58 | 45 | 32 | 21 | 15 | N/A | N/A | 0 |

## Specification Aggregation Results

Overall threshold marks in UMS (ie after conversion of raw marks to uniform marks)

|  | Maximum <br> Mark | A* | A | B | C | D | E | F | G | U |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Foundation Tier | 279 | N/A | N/A | N/A | 240 | 200 | 160 | 120 | 80 | 0 |

The total entry for the Foundation Tier was 394.

|  | Maximum <br> Mark | A* | A | B | C | D | E | F | G | U |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Higher Tier | 400 | 360 | 320 | 280 | 240 | 200 | 160 | N/A | N/A | 0 |

The total entry for the Higher Tier was 45.

The cumulative percentage of candidates awarded each grade was as follows:

|  | A* | A | B | C | D | E | F | G | U | Total No. <br> of Cands |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Percentage in <br> each grade | 2.7 | 2.5 | 1.4 | 41.5 | 25.5 | 11.9 | 5.2 | 6.2 | 3.2 | 439 |
| Cumulative <br> percentage | 2.7 | 5.2 | 6.6 | 48.1 | 73.6 | 85.4 | 90.7 | 96.8 | 100 | 439 |

439 candidates were entered for aggregation this series
For a description of how UMS marks are calculated see:
http://www.ocr.org.uk/learners/ums/index.html
Statistics are correct at the time of publication.

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