



# **General Certificate of Secondary Education**

## **Mathematics (Linear) B 4365**

### **Paper 1 Higher Tier**

## **Mark Scheme**

*Specimen Paper*

## Mark Schemes

Principal Examiners have prepared these mark schemes for specimen papers. These mark schemes have not, therefore, been through the normal process of standardising that would take place for live papers.

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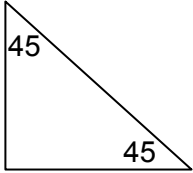
## Glossary for Mark Schemes

GCSE examinations are marked in such a way as to award positive achievement wherever possible. Thus, for GCSE Mathematics papers, marks are awarded under various categories.

- M** Method marks are awarded for a correct method which could lead to a correct answer.
- A** Accuracy marks are awarded when following on from a correct method. It is not necessary to always see the method. This can be implied.
- B** Marks awarded independent of method.
- Q** Marks awarded for quality of written communication.
- M dep** A method mark dependent on a previous method mark being awarded.
- ft** Follow through marks. Marks awarded following a mistake in an earlier step.
- SC** Special case. Marks awarded within the scheme for a common misinterpretation which has some mathematical worth.
- oe** Or equivalent. Accept answers that are equivalent.  
eg, accept 0.5 as well as  $\frac{1}{2}$

## Higher Tier

| Q    | Answer   | Mark  | Comments  |
|------|--|-------|---|
| 1(a) | 200 – 110 (boys)   | M1    | or $\frac{110}{200} \times 100$ or $110 \div 2$ or 55   |
|      | $\frac{\text{Their } 90}{200} \times 100$ or their $90 \div 2$ | M1    | or 100 – their 55   |
|      | 45   | A1    |   |
| 1(b) | 17.5 – 15 (= 2.5)  | M1    |   |
|      | Correct method for finding 2.5% of 140                         | M1    | eg, $1\% = 140 \div 100 (= 1.4)$<br>Their $1.4 \times 2 + \text{their } 1.4 \div 2$   |
|      | 3.50   | Q1    | Strand (i)<br>Correct notation required<br>Do not accept 3.5  |
|      | <b>Alternate method</b>  |       |   |
|      | Correct method for finding 15% of 140                          | M1    | eg, $10\% = 140 \div 10 (= 14)$<br>Their $14 + \text{their } 14 \div 2$   |
|      | Correct method for finding 17.5% of 140 and subtracts          | M1    | Their $15\% + (\text{their } 14 \div 2) \div 2$   |
|      | 3.50   | Q1    | Strand (i)<br>Correct notation required<br>Do not accept 3.5  |
| 2(a) | Correct reflection   | B2    | B1 For reflection in $x = 1$ or $x$ -axis or $y$ -axis  |
| 2(b) | Correct rotation   | B3    | B2 For $90^\circ$ rotation clockwise about any point other than $O$<br>B2 For $90^\circ$ rotation <b>anticlockwise</b> about $O$<br>B1 For $90^\circ$ rotation <b>anticlockwise</b> about any point other than $O$<br>SC2 For their $B$ correctly rotated |
| 3(a) | Line from (9, 0) to (10.5, 7.5)                                | B1    | oe  |
|      | Horizontal line for 30 minutes from their (10.5, 7.5)          | B1 ft |   |
|      | Line to (12, 0) from their (11, 7.5)                           | B1 ft |   |
| 3(b) | 7.5  | B1 ft | oe  |

| Q               | Answer  | Mark  | Comments   |
|-----------------|---|-------|--|
| <b>4</b>        | $2000 \times 12 \div 50 \times 5$   | M1    |  |
|                 | 2400  | A1    | Annual fuel bill   |
|                 | $(12 \times 2000) \times (0.)10$<br>(= 2400 or 240 000)   | M1    | Annual other running cost  |
|                 | $0.4 \times 24\ 000$ (= 9600)   | M1    | Annual income  |
|                 | $4800 > 3000$ , so YES  | A1 ft | Profit after deductions<br>Their 9600 – their 2400 – their 2400  |
|                 | Clear calculation of annual cost.<br>Comparison with £ 3000.<br>Conclusion drawn following through from their working | Q1    | Strand (ii) - Logical argument with key steps shown leading to correct conclusion from their working         |
| <b>5(a)</b>     | $\sum xf (3 \times 0 + 4 \times 4 + 5 \times 6 + 6 \times 9 + 7 \times 8 + 8 \times 3)$                               | M1    |  |
|                 | 180   | A1    |  |
|                 | 6   | A1 ft | ft Their total $\div 30$ if M1 awarded   |
| <b>5(b)(i)</b>  | Reference to cumulative totals for French (1, 5, 13, 21, 30)  | M1    | eg, 'I added the frequencies'  |
|                 | 5   | B1    |  |
| <b>5(b)(ii)</b> | 5 Spanish level 5 and 6<br>17 French level 5 and 6  | B1    | Lots of zeros in top right hand of table<br>The numbers above zero are on or below the leading/main diagonal |
| <b>6</b>        | Approximate isosceles triangle drawn with angle $90^\circ$ shown (or right angle sign)                                | B1    | SC1<br>                 |
|                 | At least one $45^\circ$ angle shown <b>or</b> 2 sides adjacent to $90^\circ$ marked as equal with numbers or a dash   | B1    | B0 If a side and hypotenuse marked as equal  |

| Q     | Answer  | Mark  | Comments  |
|-------|---|-------|---|
| 7     | 90 or 60 seen   | B1    | May be on diagram   |
|       | $360 - 90 - 60 - 60$  | M1    |   |
|       | 150   | A1    |   |
|       | 30  | A1 ft | ft 180 – their 150  |
| 8     | $48 + 2 \times 18 (= 84)$   | M1    | $48 + 2 \times 18 (= 84)$   |
|       | $(108 - 84) \div 2 (= 12)$  | A1    | $48 + 2 \times 18 + 2 \times 12 (= 108)$                                    |
| 9(a)  | 37  | B1    |   |
| 9(b)  | $16 + a$  | B1    | $(127 - a) \div 2$  |
|       | $2 \times \text{their } (16 + a) + a$                                       | M1    | $32 + 3a, 2(16 + a) + a$  |
|       | $2 \times \text{their } (32 + 3a) + a = 127$                                | M1    | oe $64 + 7a = 127$  |
|       | $(a =) 9$   | A1    |   |
|       | <b>Alternate method</b>   |       |   |
|       | Evidence of multiplying 8 by 2 and adding any number                        | M1    | Evidence of subtracting a number from 127 and dividing by 2                 |
|       | Evidence of multiplying their answer by 2 and adding <b>the same</b> number | M1    | Evidence of subtracting the same number from their answer and dividing by 2 |
|       | Refined attempt   | M1    |   |
|       | $(a =) 9$   | A1    |   |
| 10(a) | $2x(x - 4)$   | B1    |   |
| 10(b) | $(x \pm 1)(x \pm 2)$  | M1    |   |
|       | $(x + 1)(x + 2)$  | A1    |   |
| 10(c) | $10(x^2 - 4y^2)$  | M1    |   |
|       | $10(x + 2y)(x - 2y)$  | A2    | A1 For both $\pm 2y$<br>or $10(x + 4y)(x - y)$                              |

| Q     | Answer   | Mark | Comments  |
|-------|--|------|---|
| 11    | <b>D:</b> $2x + 5y = 10$<br><b>B:</b> $5x + 2y = 10$<br><b>A:</b> $5y + 10 = 2x$<br><b>C:</b> $2y + 10 = 5x$   | B3   | B2 If two correct or three correct<br>B1 If one correct   |
| 12(a) | Opposite angles in a cyclic quadrilateral ( $= 180^\circ$ )  | B1   |   |
| 12(b) | $CDB = 37^\circ = DBA$   | B1   |   |
|       | $BDA = 68^\circ$   | B1   |   |
|       | $BAX = 68^\circ$   | B1   |   |
| 13    | Answer in region $100 < T < 120$   | M1   |   |
|       | $\frac{20}{50}$ of 20 or sight of 8<br>or $\frac{30}{50}$ of 20 or sight of 12<br>or 100 small squares = 20 vehicles   | M1   | oe For example if drawn on $1 \text{ cm}^2$ grid,<br>$4 \text{ cm}^2 = 20$ vehicles or<br>$1 \text{ cm}^2 = 5$ vehicles |
|       | 112  | A1   |   |
|       |  |      |   |
| 14    | $AC^2 = (4 - \sqrt{2})^2 + (4 + \sqrt{2})^2$   | M1   |   |
|       | Either $16 - 4\sqrt{2} - 4\sqrt{2} + 2$<br>or $16 + 4\sqrt{2} + 4\sqrt{2} + 2$   | M1   | Allow one error   |
|       | $AC^2 = 16 - 8\sqrt{2} + 2 + 16 + 8\sqrt{2} + 2$   | A1   |   |
|       | $= 36$ or $AC = 6$   | A1   |   |
|       | Perimeter = $6 + 4 - \sqrt{2} + 4 + \sqrt{2}$<br>(= 14)  | A1   |   |
| 15    | Sight of a correct product $\frac{7}{10} \times \frac{6}{9}$<br>or $\frac{7}{10} \times \frac{3}{9}$ or $\frac{3}{10} \times \frac{7}{9}$ or $\frac{3}{10} \times \frac{2}{9}$ | M1   |   |
|       | $\frac{7}{10} \times \frac{3}{9} + \frac{3}{10} \times \frac{7}{9} + \frac{3}{10} \times \frac{2}{9}$  | M1   | $1 - \frac{7}{10} \times \frac{6}{9}$   |
|       | $\frac{48}{90}$ or $\frac{24}{45}$ or $\frac{16}{30}$ or $\frac{8}{15}$  | A1   |   |

| Q         | Answer   | Mark   | Comments  |
|-----------|--|--------|---|
| <b>16</b> | Sight of $10x$ or $-3(2x - 1)$<br>or $3x(2x - 1)$  | M1     |   |
|           | $-6x + 3$ or $6x^2 - 3x$   | M1 dep |   |
|           | $6x^2 - 7x - 3 (= 0)$  | A1     |   |
|           | $(2x - 3)(3x + 1) (= 0)$   | M1     |   |
|           | $x = 1.5$ or $-\frac{1}{3}$  | A1     |   |
|           | Full answer with stages clearly shown<br>ie, combines fractions, multiplies<br>denominator through, re-arranges<br>to a quadratic and attempts to<br>solve | Q1     | Strand (ii)<br>Logical, structured algebraic argument |