

## **GCSE**

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

Component **J567/01**: Mathematics Paper 1 (Foundation)

General Certificate of Secondary Education

### **Mark Scheme for June 2015**

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by examiners. It does not indicate the details of the discussions which took place at an examiners' meeting before marking commenced.

All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the report on the examination.

OCR will not enter into any discussion or correspondence in connection with this mark scheme.

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1. Annotations used in the detailed Mark Scheme.

| Annotation | Meaning                                                                                       |
|------------|-----------------------------------------------------------------------------------------------|
| ✓          | Correct                                                                                       |
| ✗          | Incorrect                                                                                     |
| BOD        | Benefit of doubt                                                                              |
| FT         | Follow through                                                                                |
| ISW        | Ignore subsequent working (after correct answer obtained), provided method has been completed |
| M0         | Method mark awarded 0                                                                         |
| M1         | Method mark awarded 1                                                                         |
| M2         | Method mark awarded 2                                                                         |
| A1         | Accuracy mark awarded 1                                                                       |
| B1         | Independent mark awarded 1                                                                    |
| B2         | Independent mark awarded 2                                                                    |
| MR         | Misread                                                                                       |
| SC         | Special case                                                                                  |
| ^          | Omission sign                                                                                 |

These should be used whenever appropriate during your marking.

The **M**, **A**, **B** etc annotations must be used on your standardisation scripts for responses that are not awarded either 0 or full marks.

It is vital that you annotate these scripts to show how the marks have been awarded.

It is not mandatory to use annotations for any other marking, though you may wish to use them in some circumstances.

### Subject-Specific Marking Instructions

2. **M** marks are for using a correct method and are not lost for purely numerical errors.  
**A** marks are for an accurate answer and depend on preceding **M** (method) marks. Therefore **M0 A1** cannot be awarded.  
**B** marks are independent of **M** (method) marks and are for a correct final answer, a partially correct answer, or a correct intermediate stage.  
**SC** marks are for special cases that are worthy of some credit.

| Question |     |      | Answer                                       | Marks | Part marks and guidance                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                      |
|----------|-----|------|----------------------------------------------|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|
| 1        | (a) |      | 15                                           | 1     |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                      |
|          | (b) |      | bar of height 9, width 2 in correct position | 1     |                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 8.75 to 9.25 by eye<br>Width of 2 squares<br>bar sides must be drawn |
|          | (c) |      | Adventure                                    | 1     |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                      |
|          | (d) |      | 8                                            | 1     |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                      |
|          | (e) |      | 2                                            | 2     | <b>M1</b> for 60–(6 +10 + 9+ 15+18)<br>or <b>B1</b> for 58                                                                                                                                                                                                                                                                                                                                                                                                | check graph                                                          |
| 2        | (a) | (i)  | 20                                           | 1     |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                      |
|          |     | (ii) | Rectangle drawn with perimeter of 20         | 2     | <b>M1</b> ft rectangle drawn with perimeter of their (a)(i)                                                                                                                                                                                                                                                                                                                                                                                               | Not 6 × 4 or 4 × 6<br>Condone freehand                               |
|          | (b) |      | 40                                           | 4     | <b>B3</b> for 3 of 62, 34, 26, 22, nfw<br>or 62 and 22 clearly identified as largest/smallest<br>or<br><b>B2</b> for 2 of 62, 34, 26, 22, nfw<br>or<br><b>M2</b> for 3 different rectangles of area 30cm <sup>2</sup> drawn<br>or<br><b>B1</b> for 1 of 62,34, 26, 22, nfw<br>or<br><b>M1</b> for 2 different rectangles of area 30cm <sup>2</sup> drawn<br>or<br>if 0 scored <b>SC1</b> for 2 correct factor pairs of 30, perimeters need not be stated. |                                                                      |

| Question |     |       | Answer            | Marks | Part marks and guidance                                                                                                                     |                                             |
|----------|-----|-------|-------------------|-------|---------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| 3        | (a) |       | 1108              | 1     |                                                                                                                                             |                                             |
|          | (b) |       | 182               | 1     |                                                                                                                                             |                                             |
|          | (c) |       | 602               | 1     |                                                                                                                                             |                                             |
|          | (d) |       | 0.072548          | 1     |                                                                                                                                             |                                             |
|          | (e) |       | 156               | 2     | <b>M1</b> for $0.3 \times 520$<br>or<br><b>B1</b> for $[10\% = ] 52$ or for 156% or<br>figs 156 as answer<br>Or 364 as answer with 156 seen |                                             |
|          | (f) |       | 8128              | 3     | <b>M2</b> for any complete method with<br>1 arithmetic error or<br><b>M1</b> for any complete method with<br>2 arithmetic errors            | Do not condone conceptual errors            |
| 4        | (a) |       | -11, -8, -2, 0, 6 | 1     |                                                                                                                                             | Ignore units                                |
|          | (b) |       | 2                 | 1     |                                                                                                                                             |                                             |
|          | (c) |       | 23                | 1     |                                                                                                                                             | accept -23                                  |
| 5        |     |       | 4 2               | 2     | <b>B1</b> each answer                                                                                                                       |                                             |
| 6        | (a) |       | $2j - 2k$ oe cao  | 2     | <b>B1</b> $2j$ or $-2k$ in final answer                                                                                                     | $2j + -2k$ scores <b>B1</b>                 |
|          | (b) | (i)   | 6                 | 1     |                                                                                                                                             |                                             |
|          |     | (ii)  | 5                 | 2     | <b>M1</b> $7d = 51 - 16$ or<br>ft $d = \textit{their } 35/7$                                                                                | Must be equation in $d$                     |
|          |     | (iii) | 5000              | 2     | <b>M1</b> for $x/100 = 36 + 14$ oe<br>or ft $x = \textit{their } 50 \times 100$                                                             | Must be equation in $x$                     |
|          | (c) |       | 47                | 2     | <b>B1</b> for $[5 \times 7 =] 35$ or $[3 \times 4 =] 12$<br>or <b>M1</b> for $5 \times 7$ or $3 \times 4$                                   |                                             |
|          | (d) |       | $6x + 12$ cao     | 1     |                                                                                                                                             |                                             |
| 7        | (a) | (i)   | - 14              | 1     |                                                                                                                                             |                                             |
|          |     | (ii)  | subtracted 8      | 1     |                                                                                                                                             | Need quantity and direction<br>See Appendix |
|          | (b) |       | 2, 8, 14          | 2     | <b>M1</b> for 2 correct terms in correct<br>position<br>or <b>SC1</b> for -4, 2, 8                                                          |                                             |

| Question |     |      | Answer                                                                                              | Marks | Part marks and guidance                                                                                                                                                                                        |                                                                         |
|----------|-----|------|-----------------------------------------------------------------------------------------------------|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| 8        | (a) |      | 7                                                                                                   | 1     |                                                                                                                                                                                                                |                                                                         |
|          | (b) |      | 60                                                                                                  | 1     |                                                                                                                                                                                                                |                                                                         |
| 9        | (a) |      | CSM, MSC, MCS, SCM, SMC only                                                                        | 2     | M1 3 additional correct                                                                                                                                                                                        |                                                                         |
|          | (b) |      | 610 cao                                                                                             | 1     |                                                                                                                                                                                                                |                                                                         |
|          | (c) |      | 5 000 000                                                                                           | 1     |                                                                                                                                                                                                                | Accept words                                                            |
| 10       | (a) |      | 2 sections shaded oe                                                                                | 1     |                                                                                                                                                                                                                |                                                                         |
|          | (b) |      | 24                                                                                                  | 2     | M1 for $36 \div 3$<br>or $36 \times 2 \div 3$ oe                                                                                                                                                               | 12 implies M1                                                           |
| 11       | (a) |      | Any two of 1, 2, 5 or 10                                                                            | 1     |                                                                                                                                                                                                                | Condone extra if correct                                                |
|          | (b) |      | 6 or -6                                                                                             | 1     |                                                                                                                                                                                                                |                                                                         |
|          | (c) |      | 900                                                                                                 | 2     | B1 for 1000 or 100                                                                                                                                                                                             |                                                                         |
|          | (d) |      | $\frac{1}{7}$                                                                                       | 1     |                                                                                                                                                                                                                | Accept 0.142[8...] if calculation seen                                  |
|          | (e) | (i)  | 8                                                                                                   | 1     |                                                                                                                                                                                                                |                                                                         |
|          |     | (ii) | Added before squaring                                                                               | 1     |                                                                                                                                                                                                                | Can be shown numerically                                                |
| 12       | (a) |      | 220 isw                                                                                             | 2     | M1 for $5.5 \times 40$ oe                                                                                                                                                                                      | allow 3 hours 40<br>Do not penalise incorrect conversion after 220 seen |
|          | (b) |      | 1415 or 2:15 [pm] oe                                                                                | 1     |                                                                                                                                                                                                                | Do not accept 2:15am                                                    |
|          | (c) |      | 20                                                                                                  | 2     | M1 for 1 part = 4, can be implied by 8                                                                                                                                                                         |                                                                         |
|          | (d) |      | 6                                                                                                   | 2     | B1 for 1500 or 0.25[0]                                                                                                                                                                                         |                                                                         |
|          | (e) |      | 1425 or 2:25 [pm]                                                                                   | 1     |                                                                                                                                                                                                                | Do not accept 2:25am                                                    |
| 13       |     |      | £24 as final statement<br>with reference made to either £25 or 20kg or one large bag with no errors | 3     | M2 for £24 nfw<br>or<br>M1 for $5 \times 4$ or $6 \times 4$<br>or recognition 20 kg needed<br>or one large bag last 40 days<br>or one small bag lasts 10 days<br>or large bag £1.25/kg or small bag £1.2[0]/kg | Reference to £25 or 20kg or one large bag may be in the working         |

| Question |     |      | Answer                                                                                                                                                                                                                                                                                                                                                                       | Marks      | Part marks and guidance                                                                                           |                                                                                                                                                                                                                                                                                                                        |
|----------|-----|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 14       | (a) |      | 48                                                                                                                                                                                                                                                                                                                                                                           | 3          | M1 for $360 - (90+108+30)$ soi by 132 and<br>M1 dep for $180 - \text{their } 132$                                 |                                                                                                                                                                                                                                                                                                                        |
|          | (b) | (i)  | 68 <b>and</b> alternate [angle]                                                                                                                                                                                                                                                                                                                                              | 1          | condone Z-angle<br><br>penalise alternate and corresponding together and penalise alternate and opposite together | condone 'alternative' and 'alternating'.<br>Allow 68 and corresponding providing 68 marked as opposite on diagram at B or D<br>Allow 68 and [angles in a] four sided shape equals 360 (angles must be marked on the diagram)<br>Allow [angles in a] triangle equals 180 providing 95 is marked in the correct position |
|          |     | (ii) | 95<br><br>one mark for each reason (maximum of <b>two</b> ) from <ul style="list-style-type: none"> <li>• angle[s] ... triangle [add to 180]</li> <li>• angle[s]... quadrilateral [add to 360]</li> <li>• corresponding or allied [angles]</li> <li>• [vertically] opposite [angles] or angles round a point [add to 360]</li> <li>• angles ... line [add to 180]</li> </ul> | 1<br><br>2 | or FT $180 - 17 - \text{their (b)(i)}$<br><br>condone F-angle<br>condone X-angle                                  | accept 4 sided shape/trapezium                                                                                                                                                                                                                                                                                         |

| Question |  |  | Answer               | Marks | Part marks and guidance                                                                                                                                                                                                                                                                                                                                                             |                                                                              |
|----------|--|--|----------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| 15       |  |  | complete correct net | 3     | <p><b>B2</b> for correct net with additional rectangles</p> <p>Or 3 or 4 additional correct rectangles in the correct places</p> <p>Or correct outline with missing internal lines</p> <p><b>B1</b> for 3 or 4 additional correct rectangles in the correct places with extra incorrect rectangles</p> <p>or for 1 or 2 additional correct rectangle(s) in the correct place(s)</p> | <p>Condone freehand and dotted internal lines, mark intent, ignore flaps</p> |

| Question   | Answer                                                                                                                                                                                                                                                                                 | Marks        | Part marks and guidance                                                                                                                                                                                                                                       |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>16*</b> | The correct final answer of R[osie] = 17, D[aisy] = 14, T[illy] = 12 and M[olly] = 8 with supporting algebraic working or at least one other numerical attempt seen. Correct spelling and grammar is used and the working is set out in a logical manner that makes it easy to follow. | <b>5</b>     |                                                                                                                                                                                                                                                               |
|            | The correct final answer is obtained with no other attempts seen.                                                                                                                                                                                                                      | <b>4 – 3</b> | Three correct algebraic expressions or three different numerical attempts are seen or the daughters are all in the correct order and clearly identified, in the final answer with Rosie as the oldest, then Daisy, then Tilly and then Molly as the youngest. |
|            | Two correct algebraic expressions or two numerical attempts are seen or a realisation that Rosie is the oldest and Molly is the youngest.                                                                                                                                              | <b>2 – 1</b> | One correct algebraic expression or one numerical attempt is seen or a realisation that Rosie is the oldest or Molly is the youngest.                                                                                                                         |
|            | No worthwhile work attempted.                                                                                                                                                                                                                                                          | <b>0</b>     |                                                                                                                                                                                                                                                               |

| Question |     |      | Answer                                                                                                                                      | Marks | Part marks and guidance                                                                                                                                                                                                            |                                                                                                                                                                              |
|----------|-----|------|---------------------------------------------------------------------------------------------------------------------------------------------|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 17       | (a) |      | it is a leading question                                                                                                                    | 1     | accept any correct reason                                                                                                                                                                                                          | see appendix                                                                                                                                                                 |
|          | (b) |      | a suitable question including month with at least four response boxes covering all possibilities from 0 to at least 20 and with no overlaps | 2     | <b>B1</b> for a suitable question with response boxes and one error which would be either<br>less than four boxes<br>or not covering all the possibilities<br>or with overlaps<br><br>or correct boxes with no/incorrect question. | Can go past 20<br>condone $1 \leq 5$ as meaning $1 \leq \text{answer} \leq 5$<br>Interpret 20+ as 20 or more<br>Question must have month and imply journeys/trips/train      |
| 18       | (a) |      | Four points correctly plotted                                                                                                               | 2     | <b>B1</b> for 2 points correctly plotted                                                                                                                                                                                           | Overlay gives guidance, the tolerance $\pm \frac{1}{2}$ small square                                                                                                         |
|          | (b) |      | positive                                                                                                                                    | 1     |                                                                                                                                                                                                                                    | ignore embellishments<br>accept +ve                                                                                                                                          |
|          | (c) |      | the height increases as the width increases oe                                                                                              | 1     | accept any equivalent response                                                                                                                                                                                                     |                                                                                                                                                                              |
|          | (d) | (i)  | correct ruled line of best fit                                                                                                              | 1     | Crossing on "w = 10" 3.5-7.5 and on "w=25" 12.5-17.5                                                                                                                                                                               | use overlay to judge the validity of the line of best fit                                                                                                                    |
|          |     | (ii) | 12- 18                                                                                                                                      | 1     |                                                                                                                                                                                                                                    |                                                                                                                                                                              |
|          | (e) |      | (18, 3.5) indicated on diagram                                                                                                              | 1     |                                                                                                                                                                                                                                    |                                                                                                                                                                              |
| 19       |     |      | Correct enlargement (-1,-3) (1,-3) (1,1)                                                                                                    | 3     | <b>B2</b> correct centre incorrect sf or 2 correct vertices<br><br><b>B1</b> correct sf incorrect centre                                                                                                                           | must be an enlargement in the correct orientation<br>tolerance of 2mm<br><br>triangle of sf 2 in correct orientation. A translation of the correct triangle tolerance of 2mm |
| 20       |     |      | 127                                                                                                                                         | 4     | accept any correct method                                                                                                                                                                                                          | See additional guidance<br>Mark the method which leads to the final answer                                                                                                   |

**APPENDIX**Exemplar responses for 7aii

| <b>Response</b>                               | <b>Mark</b> |
|-----------------------------------------------|-------------|
| – 8 May be written between the listed numbers | 1           |
| Subtract 8                                    | 1           |
| Goes down 8                                   | 1           |
| $26 - 8n$ oe                                  | 1           |
| + 8                                           | 0           |
| Difference of 8                               | 0           |
| Goes down in 8 times table                    | 0           |
| I plus 8 each time going backwards            | 0           |

Exemplar responses for 17a

| <b>Response</b>                                               | <b>Mark</b>    |
|---------------------------------------------------------------|----------------|
| It is a leading question                                      | 1              |
| It is biased                                                  | 1              |
| You are telling them the answer                               | 1              |
| Do you agree is the wrong term to use                         | 0 (not enough) |
| There are only 3 boxes to tick                                | 0              |
| It doesn't say which part of public transport buses or trains | 0              |
| People may not have used public transport 5 years ago         | 0              |

Exemplar responses for 18c

Do not allow larger or bigger for height

| <b>Response</b>                           | <b>Mark</b> |
|-------------------------------------------|-------------|
| Taller trees have wider trunks            | 1           |
| Thicker trees are taller                  | 1           |
| Trees with a bigger trunk are taller      | 1           |
| The thicker the tree the higher the trunk | 1           |
| Both go up                                | 1           |
| The higher the wider                      | 1 BOD       |

|                                                       |   |
|-------------------------------------------------------|---|
| The smaller the width the shorter the tree            | 1 |
| Positive [correlation]                                | 0 |
| The height and the width both change                  | 0 |
| Height is greater than the width                      | 0 |
| Bigger trees have bigger trunks                       | 0 |
| Smaller the width the taller the tree                 | 0 |
| The bigger the width of the trunk the larger the tree | 0 |
| The height and the width both change                  | 0 |

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