



# Mark Scheme (Results)

June 2016

Pearson Edexcel International GCSE  
Mathematics A (4MA0)  
Paper 1FR

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## General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.
- **Types of mark**
  - M marks: method marks
  - A marks: accuracy marks
  - B marks: unconditional accuracy marks (independent of M marks)
- **Abbreviations**
  - cao – correct answer only
  - ft – follow through
  - isw – ignore subsequent working
  - SC - special case
  - oe – or equivalent (and appropriate)
  - dep – dependent
  - indep – independent
  - eeo – each error or omission

- **No working**

If no working is shown then correct answers normally score full marks

If no working is shown then incorrect (even though nearly correct) answers score no marks.

- **With working**

If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.

If it is clear from the working that the “correct” answer has been obtained from incorrect working, award 0 marks.

Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks.

If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.

If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

If there is no answer on the answer line then check the working for an obvious answer.

- **Ignoring subsequent work**

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: eg. Incorrect cancelling of a fraction that would otherwise be correct.

It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect eg algebra.

Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

- **Parts of questions**

Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

| Apart from Question 21, where the mark scheme states otherwise, the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method. |         |                                     |      |                                                   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------------------------------------|------|---------------------------------------------------|
| Q                                                                                                                                                                              | Working | Answer                              | Mark | Notes                                             |
| 1a                                                                                                                                                                             |         | 24                                  | 1    | B1                                                |
| b                                                                                                                                                                              |         | 4 icons shown                       | 1    | B1                                                |
| c                                                                                                                                                                              |         | 92                                  | 2    | M1 '24' + 28 + 8 + 32 or $11.5 \times 8$ oe<br>A1 |
|                                                                                                                                                                                |         |                                     |      |                                                   |
|                                                                                                                                                                                |         |                                     |      | <b>Total 4 marks</b>                              |
| 2 (a)                                                                                                                                                                          |         | Two thousand four hundred and sixty | 1    | B1 Must be all words                              |
| (b)                                                                                                                                                                            |         | seventy                             | 1    | B1 Accept tens, 7 tens, 70                        |
| (c)                                                                                                                                                                            |         | 240                                 | 1    | B1                                                |
| (d)                                                                                                                                                                            |         | 3110                                | 1    | B1                                                |
| (e)                                                                                                                                                                            |         | 280                                 | 1    | B1                                                |
| (f)                                                                                                                                                                            |         | 09 10                               | 1    | B1 accept 9 10                                    |
|                                                                                                                                                                                |         |                                     |      | <b>Total 6 marks</b>                              |

| Q     | Working | Answer   | Mark | Notes                |
|-------|---------|----------|------|----------------------|
| 3 (i) |         | diameter | 1    | B1                   |
| (ii)  |         | chord    | 1    | B1                   |
| (iii) |         | acute    | 1    | B1                   |
|       |         |          |      | <b>Total 3 marks</b> |

| Q        | Working | Answer      | Mark | Notes                                             |
|----------|---------|-------------|------|---------------------------------------------------|
| 4 (a)(i) |         | metres      | 1    | B1 Accept m                                       |
| (a)(ii)  |         | millilitres | 1    | B1 Accept ml, cm <sup>3</sup><br>Do not accept cc |
| (b)      |         | 8000        | 1    | B1                                                |
|          |         |             |      | <b>Total 3 marks</b>                              |

| Q       | Working | Answer                 | Mark | Notes                |
|---------|---------|------------------------|------|----------------------|
| 5 (a)   |         | 0.043, 0.06, 0.5, 0.62 | 1    | B1                   |
| (b)     |         | 0.4                    | 1    | B1oe eg 4/10         |
| (c)     |         | 2.245                  | 1    | B1                   |
| (d)(i)  |         | 3478                   | 1    | B1                   |
| (d)(ii) |         | 8734                   | 1    | B1                   |
|         |         |                        |      | <b>Total 5 marks</b> |

| Q     | Working | Answer | Mark | Notes                                         |
|-------|---------|--------|------|-----------------------------------------------|
| 6 (a) |         | 2/5    | 2    | M1 For 6/15 oe (must be a fraction)<br>A1 cao |
| (b)   |         | 28     | 1    | B1                                            |
| (c)   |         | 0.15   | 1    | B1                                            |
| (d)   |         | 58     | 1    | B1                                            |
| (e)   |         | 7.05   | 1    | B1                                            |
|       |         |        |      | <b>Total 6 marks</b>                          |

| Q     | Working                                                                                      | Answer | Mark | Notes                                                                                                                                                                                                                             |
|-------|----------------------------------------------------------------------------------------------|--------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7 (a) |                                                                                              | 38, 42 | 2    | B2 B1 for 1 correct<br>Allow ft, eg 37, 41<br>NB: B0 for 36,38, etc                                                                                                                                                               |
| (b)   |                                                                                              | Add 4  | 1    | B1                                                                                                                                                                                                                                |
| (c)   | $18 + 19 \times 4$ or $14 + 20 \times 4$ or $4n + 14$<br>or<br>18, 22, 26, 30, ....., 90, 94 | 94     | 2    | M1 Allow $18 + 20 \times 4$ or 90 or 98<br><br>List should show a clear intention of adding 4 with at least 5 terms (can count 42 as one of the 5 terms but not 18, 22, 26, 30, 34, 38).<br>Condone 1 arithmetic error.<br><br>A1 |
|       |                                                                                              |        |      | <b>Total 5 marks</b>                                                                                                                                                                                                              |

| Q     | Working                             | Answer | Mark | Notes                                            |
|-------|-------------------------------------|--------|------|--------------------------------------------------|
| 8 (a) |                                     | 9      | 1    | B1                                               |
| (b)   |                                     | 5      | 1    | B1                                               |
| (c)   | $0.5 \times 10 \times 12 \times 40$ | 2400   | 2    | M1 $0.5 \times 10 \times 12 \times 40$<br>A1 cao |
|       |                                     |        |      | <b>Total 4 marks</b>                             |

| Q            | Working                                                | Answer | Mark | Notes                              |
|--------------|--------------------------------------------------------|--------|------|------------------------------------|
| <b>9</b> (a) |                                                        | 95     | 1    | B1                                 |
| (b)(i)       |                                                        | 140    | 1    | B1                                 |
| (b)(ii)      | The sum of the angles on a straight line = $180^\circ$ |        | 1    | B1                                 |
| (c)          | $180 - (95 + 40)$                                      | 45     | 2    | M1 For $180 - (95 + 40)$<br>A1 cao |
|              |                                                        |        |      | <b>Total 5 marks</b>               |

| Q             | Working | Answer | Mark | Notes                                                                               |
|---------------|---------|--------|------|-------------------------------------------------------------------------------------|
| <b>10</b> (a) |         | 4      | 2    | M1 For 1 and 5 identified<br>A1                                                     |
| (b)           |         | 2      | 2    | M1 For 12.5 or 13<br>A1 NB: Award M0A0 if 2 comes from calculating the mean (=2.04) |
|               |         |        |      | <b>Total 4 marks</b>                                                                |

| Q             | Working              | Answer       | Mark | Notes                         |
|---------------|----------------------|--------------|------|-------------------------------|
| <b>11</b> (a) | $8e - 11e + 2f + 3f$ | $-3e + 5f$   | 2    | B2 B1 for $-3e$ or $5f$       |
| (b)           |                      | $6y^2 - 14y$ | 2    | M1 For $6y^2$ or $-14y$<br>A1 |
|               |                      |              |      | <b>Total 4 marks</b>          |

| Q      | Working             | Answer            | Mark | Notes                                                    |
|--------|---------------------|-------------------|------|----------------------------------------------------------|
| 12 (a) |                     | 2                 | 1    | B1                                                       |
| (b)    | $(30 + 5) \times 3$ | 105               | 2    | M1 For $(30 + 5) \times 3$ or $35 \times 3$<br>A1<br>cao |
| (c)    | $\frac{x}{3} - 5$   | $\frac{x}{3} - 5$ | 2    | M1 For $\frac{x}{3}$ or $x \div 3$ oe<br>A1<br>oe        |
|        |                     |                   |      | <b>Total 5 marks</b>                                     |

| Q      | Working | Answer | Mark | Notes                |
|--------|---------|--------|------|----------------------|
| 13 (i) |         | 9      | 1    | B1                   |
| (ii)   |         | 56     | 1    | B1                   |
|        |         |        |      | <b>Total 2 marks</b> |

| Q      | Working | Answer | Mark | Notes                |
|--------|---------|--------|------|----------------------|
| 14 (a) |         | 32     | 1    | B1                   |
| (b)    |         | 4      | 1    | B1                   |
|        |         |        |      | <b>Total 2 marks</b> |

| Q      | Working                                                                        | Answer | Mark | Notes                      |
|--------|--------------------------------------------------------------------------------|--------|------|----------------------------|
| 15 (a) | $2 \times -5 + 3 \times 7$                                                     | 11     | 2    | M1 For $-10$ or $21$<br>A1 |
| (b)    | $5x - 20 (= 14)$ or $x - 4 = 14/5$<br>$5x = 34$ or $x = 4 + 14/5$<br>$x = 6.8$ | 6.8    | 2    | M1<br>A1oe Allow $34/5$ oe |
|        |                                                                                |        |      | <b>Total 4 marks</b>       |

| Q                    | Working                                                                  | Answer | Mark | Notes                                                                     |
|----------------------|--------------------------------------------------------------------------|--------|------|---------------------------------------------------------------------------|
| <b>16</b> (a) (i)    |                                                                          | 5/50   | 1    | B1oe                                                                      |
| (a) (ii)             | $1 - \frac{35+5}{50}$                                                    | 10/50  | 2    | M1ft<br>A1ft $1 - \frac{35+5}{50}$ or $50 - 35 - 5$ or 10                 |
| (b)                  | $\frac{35}{50} \times 300$ oe, eg $35 \times 6$ , $0.7 \times 300$ , etc | 210    | 2    | M1 A fully correct method<br><br>A1 Cao (award $\frac{210}{300}$ M1 only) |
| <b>Total 5 marks</b> |                                                                          |        |      |                                                                           |

| Q                    | Working                                                                                                 | Answer | Mark | Notes                                               |
|----------------------|---------------------------------------------------------------------------------------------------------|--------|------|-----------------------------------------------------|
| <b>1.</b> (a)        | $\frac{7}{10} \times 30$ oe (eg $30 \div (7 + 3) = 3$ , $7 \times '3'$ ) or<br>$\frac{3}{10} \times 30$ | 21     | 2    | M1 A Complete method to find either share<br><br>A1 |
| (b)                  | $\frac{75}{3} \times 4$ oe                                                                              | 100    | 2    | M1 Complete method<br><br>A1                        |
| <b>Total 4 marks</b> |                                                                                                         |        |      |                                                     |

| Q             | Working                                | Answer | Mark | Notes                |
|---------------|----------------------------------------|--------|------|----------------------|
| <b>18</b> (a) |                                        | 0      | 1    | B1                   |
| (b)           | $1 - (0.1 + 0.15 + 0.05 + 0.2 + 0.15)$ | 0.35   | 2    | M1<br>A1 oe          |
|               |                                        |        |      | <b>Total 3 marks</b> |

| Q             | Working                                          | Answer | Mark | Notes                                                        |                                      |
|---------------|--------------------------------------------------|--------|------|--------------------------------------------------------------|--------------------------------------|
| <b>19</b> (a) | $\frac{8}{100} \times 28$ or 2.24<br>28 – "2.24" | 25.76  | 3    | M1<br>M1 dep<br>A1                                           | M2 for $\frac{92}{100} \times 28$ oe |
| (b)           | $\frac{3}{0.08}$ or $\frac{3}{8} \times 100$ oe  | 37.50  | 3    | M2 M1 for $\frac{3}{8}$ or 0.375 or 3 = 8%<br>A1 Accept 37.5 |                                      |
|               |                                                  |        |      |                                                              | <b>Total 6 marks</b>                 |

| Q             | Working                                                                                                                                                                                                         | Answer                               | Mark | Notes                                                                                                                                                                                                                      |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 20 (a)        | $-9 < 3x \leq 6$ or $3x > -9$ and $3x \leq 6$ or<br>$-\frac{4}{3} < x + \frac{5}{3} \leq \frac{11}{3}$ or $x + \frac{5}{3} > -\frac{4}{3}$ and $x + \frac{5}{3} \leq \frac{11}{3}$<br>or $x > -3$ or $x \leq 2$ |                                      | 3    | M2 For both ends correct for $3x$ or<br>$x + \frac{5}{3}$ or one end correct for $x$<br>M1 for one end correct for $3x$ or<br>$x + \frac{5}{3}$ , eg $3x > -9$ or<br>$3x \leq 6$ or<br>answers of $x = -3$ & $x = 2$<br>A1 |
| (b)           |                                                                                                                                                                                                                 | $-3 < x \leq 2$<br>$-2, -1, 0, 1, 2$ | 2    | B2ft B1 for five correct values and one incorrect value or four correct values with no incorrect value<br>Only ft from an inequality in the form $a < x \leq b$                                                            |
| Total 5 marks |                                                                                                                                                                                                                 |                                      |      |                                                                                                                                                                                                                            |

| Q   | Working                                                                                                                    | Answer                                            | Mark | Notes                                                                                                 |
|-----|----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|------|-------------------------------------------------------------------------------------------------------|
| 21. | $792 = 2 \times 396 = 2 \times 2 \times 198$<br>$= 2 \times 2 \times 2 \times 99 = 2 \times 2 \times 2 \times 3 \times 33$ | $2 \times 2 \times 2 \times 3 \times 3 \times 11$ | 3    | M1 For at least 2 correct steps in repeated factorisation (may be seen in a tree diagram or ‘ladder’) |
|     | 2, 2, 2, 3, 3, 11                                                                                                          |                                                   |      | A1 Condone inclusion of 1 (maybe a fully correct tree or factor ladder)                               |
|     |                                                                                                                            |                                                   |      | A1 Or $2^3 \times 3^2 \times 11$<br>NB: Candidates showing no working score 0 marks                   |
|     |                                                                                                                            |                                                   |      | Total 3 marks                                                                                         |

| Q             | Working | Answer                                   | Mark | Notes                                                                                                                                                                                                   |
|---------------|---------|------------------------------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 22 (a)        |         | Translation<br>5 to the right and 4 down | 2    | B2 B1 for translation<br>B1 for 5 to the right and 4 down<br>or $\begin{pmatrix} 5 \\ -4 \end{pmatrix}$<br>These marks are independent but award no marks if the answer is not a single transformation. |
| (b)           |         | R correct                                | 2    | B2 $(-2, -1)$ , $(0, -1)$ , $(0, -2)$ ,<br>$(-1, -2)$ ,<br>Condone omission of label<br>B1 for $90^\circ$ anticlockwise rotation about (1,0) or for<br>Correct orientation but incorrect position.      |
| Total 4 marks |         |                                          |      |                                                                                                                                                                                                         |

| Q  | Working                                                                   | Answer | Mark | Notes                        |
|----|---------------------------------------------------------------------------|--------|------|------------------------------|
| 23 | $14.6^2 - 3.2^2$ or $213.16 - 10.24$ (=202.92)<br>$\sqrt{14.6^2 - 3.2^2}$ | 14.2   | 3    | M1<br>M1 Dep<br>A1 Awrt 14.2 |
|    |                                                                           |        |      | <b>Total 3 marks</b>         |

| Q   | Working                                               | Answer | Mark | Notes                                                                                   |
|-----|-------------------------------------------------------|--------|------|-----------------------------------------------------------------------------------------|
| 24. | $\frac{360}{8}$ or $180 - \frac{(8-2) \times 180}{8}$ | 45     | 2    | M1 For complete correct method for exterior angle<br>A1 Do not isw interior angle found |
|     |                                                       |        |      | <b>Total 2 marks</b>                                                                    |

| Q  | Working                                                                                                    | Answer | Mark | Notes                                                                                                                                                                                                                                                                                      |
|----|------------------------------------------------------------------------------------------------------------|--------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 25 | $3 \times 13 + 10 \times 10 + 17 \times 16 + 24 \times 7 + 31 \times 4$<br>Or $39 + 100 + 272 + 168 + 124$ | 703    | 3    | M1 For at least 2 products $f \times x$ consistently within intervals (including end points)<br>M1 For completely correct method (condone 1 error)<br>NB: Products do not need to be evaluated<br>A1 cao<br>Do not ISW to find mean<br>SC award 2 marks for 14.06 if no other marks gained |
|    |                                                                                                            |        |      | <b>Total 3 marks</b>                                                                                                                                                                                                                                                                       |

