



Mark Scheme (Results)

Summer 2019

Pearson Edexcel International GCSE
In Mathematics A (4MA1)
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
 - awrt – answer which rounds to
 - 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.

If a candidate misreads a number from the question. Eg. Uses 252 instead of 255; method marks may be awarded provided the question has not been simplified. Examiners should send any instance of a suspected misread to review. 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 to another.

| International GCSE Maths | | | | |
|---|---------|--|------|--|
| Apart from question 2d, 18b, 23 (where the mark scheme states otherwise) the correct answer, unless clearly obtained from an incorrect method, should be taken to imply a correct method. | | | | |
| Question | Working | Answer | Mark | Notes |
| 1 (a) (i) | | 129 | 1 | B1 |
| (a)(ii) | | 80 | 1 | B1 |
| (b)(i) | | 2457 | 1 | B1 |
| (b)(ii) | | $\begin{array}{r} _ _ _ 4 \text{ or} \\ _ _ _ 2 \end{array}$ | 1 | B1 4 cards arranged with the 4 or 2 at the end |
| | | | | Total 4 marks |

| | | | | |
|--------------|------------|-------------|---|---|
| 2 (a) | | Vietnam | 1 | B1 |
| (b) | | 30 | 1 | B1 |
| (c) | | Correct bar | 1 | B1 |
| (d) | "43" - "3" | | 2 | M1 (41 - 44) - (1 - 4) |
| | | 40 | | A1 dep on M1, ft answers in range given |
| | | | | Total 5 marks |

| | | | | | |
|----------------------|-----|--|---|---|--|
| 3 | (a) | $\frac{72}{100}, \frac{36}{50}$ | | 2 | M1 Or other fraction equivalent to $\frac{18}{25}$ |
| | | | $\frac{18}{25}$ | | A1 |
| | (b) | | 75 | 1 | B1 |
| | (c) | e.g. $\frac{65}{100} \times 720, 0.65 \times 720, 720 \div 100 \times 65$ oe | | 2 | M1 |
| | | | 468 | | A1 |
| | (d) | $\frac{9}{20} = 0.45$ or $\frac{4}{9} = 0.44\dots$ | | 2 | M1 OR 4 out of 5 numbers in the correct order OR correct reverse order |
| | | | 40.5%, 0.427, 0.43, $\frac{4}{9}, \frac{9}{20}$ | | A1 oe |
| Total 7 marks | | | | | |

| | | | | | |
|----------------------|-----|---|---|---|--|
| 4 | (a) | | | 2 | M1 Any rectangle |
| | | e.g. Rectangle $1 \times 6, 2 \times 5, 3 \times 4, 3.5 \times 3.5$ | Rectangle with perimeter 14 cm | | A1 |
| | (b) | | | 2 | M1 Any right-angled triangle or any triangle with area 12 cm^2 |
| | | | Right-angled triangle with area 12 cm^2 | | A1 e.g. B 4 cm & H 6 cm, B 3 cm & H 8 cm |
| Total 4 marks | | | | | |

| | | | | | |
|----------|-----|--|-----|---|----------------------|
| 5 | (a) | | 14 | 1 | B1 Allow -14 |
| | (b) | | 18 | 1 | B1 Allow -18 |
| | (c) | | -12 | 1 | B1 |
| | | | | | Total 3 marks |

| | | | | | |
|----------|-----|--|--------------|---|---|
| 6 | (a) | | tangent | 1 | B1 |
| | (b) | | Radius drawn | 1 | B1 Intention clear - do not accept diameter |
| | (c) | | 230 | 1 | B1 |
| | | | | | Total 3 marks |

| | | | | | |
|----------|---|------|---|----|--|
| 7 | $4 \times 2.40 + 1.20 + 5.75 (= 16.55)$ | | 3 | M1 | or subtracting 2 of 4×2.40 , 1.20, 5.75 from 20 or $20 - 5.75 (= 14.25)$ and $4 \times 2.40 + 1.20 (= 10.8(0))$ |
| | $20 - (4 \times 2.40 + 1.20 + 5.75) (= 3.45)$ | | | M1 | or "14.25" - "10.8(0)" (= 3.45) |
| | | 1.15 | | A1 | |
| | | | | | Total 3 marks |

| | | | | | |
|----------|-----|---|-----------------------|---|---|
| 8 | (a) | | $4a$ | 1 | B1 |
| | (b) | | $15c^2$ | 1 | B1 |
| | (c) | | $8e + 3g$ | 2 | B2 B1 for $8e$ or $3g$ seen |
| | (d) | | 23 | 1 | B1 |
| | (e) | | $5(y + 3)$ | 1 | B1 |
| | (f) | $H + w = 3y$ or $-H - w = -3y$ or $\frac{H}{3} = y - \frac{w}{3}$ | | 2 | M1 |
| | | | $y = \frac{H + w}{3}$ | | A1 oe e.g. $y = \frac{-H - w}{-3}$, $y = \frac{H}{3} + \frac{w}{3}$ |
| | | | | | Total 8 marks |

| | | | | | |
|----------|----------|---|----------------|---|---------------------------|
| 9 | (a)(i) | | $\frac{2}{11}$ | 3 | B1 oe e.g. 0.18.... |
| | (a)(ii) | | $\frac{5}{11}$ | | B1 oe, e.g.0.45... |
| | (a)(iii) | | 0 | | B1 oe e.g. $\frac{0}{11}$ |
| | (b) | $\frac{1}{6} = \frac{5}{30}$ oe or $5 \times 6 (= 30)$ | | 2 | M1 |
| | | | 18 | | A1 |
| | | | | | Total 5 marks |

| | | | | | |
|-----------|-----|---|----------|---|---|
| 10 | (a) | | 47 | 1 | B1 |
| | (b) | $(82 + 9) \div 7$ or $82 + 9 (= 91)$ | | 2 | M1 for + 9 or $\div 7$ |
| | | | 13 | | A1 |
| | (c) | | $7y - 9$ | 2 | B2 oe e.g. $y \times 7 - 9$ (B1) for $7y$ or $y - 9$ or $y = 7y - 9$ |
| | | | | | Total 5 marks |

| | | | | |
|-----------|--|---|---|--|
| 11 | $(-1, -5)(0, -3)(1, -1)(2, 1)(3, 3)(4, 5)(5, 7)$ | Correct line between $x = -1$ and $x = 5$ | 3 | <p>B3 For a correct line between $x = -1$ and $x = 5$</p> <p>B2 for a correct line through at least 3 of $(-1, -5)(0, -3)(1, -1)(2, 1)(3, 3)(4, 5)(5, 7)$ OR for all of $(-1, -5)(0, -3)(1, -1)(2, 1)(3, 3)(4, 5)(5, 7)$ plotted, not joined.</p> <p>B1 For at least 2 correct points stated (may be in a table) OR For a line drawn with a positive gradient through $(0, -3)$ OR for a line with gradient of 2</p> |
| | | | | Total 3 marks |

| | | | | |
|-----------|--|------------|---|--|
| 12 | $(A =) \frac{1}{5} \times 75 (=15)$ oe or $\left(1 - \frac{1}{5}\right) \times 75 (=60)$ oe | | 3 | M1 |
| | $\frac{75 - "15"}{2} (=30)$ oe or $\frac{"75" - 15 - 4}{2} (=28)$ oe or $\frac{"75" - 15 + 4}{2} (=32)$ oe | | | M1 workings could be seen in an equation |
| | | 15, 32, 28 | | A1 |
| | | | | Total 3 marks |

| | | | | |
|-----------|--|---------------|---|---|
| 13 | | $T = 2p + 3c$ | 3 | <p>B3 [award B2 if $T = 2p + 3c$ is incorrectly simplified] (condone $T = 2 \times p + 3 \times c$)</p> <p>(B2) for $T = 2p + kc$ or $T = kp + 3c$ (k may be zero) or $2p + 3c$</p> <p>(B1) for $2p$ or $3c$ or $T =$ a linear expression in p and c e.g. $T = p + c$</p> |
| | | | | Total 3 marks |

| | | | | | | |
|-----------|-----|--|---------------|---|----|--|
| 14 | (a) | (-3, 3)(-1, 3)(-1, 6)(-2, 6)(-2, 4)(-3, 4) | | 1 | B1 | Correct translation of shape P |
| | (b) | | Rotation | 3 | B1 | |
| | | | 90° clockwise | | B1 | or -90° or 270° anticlockwise |
| | | | About (O) | | B1 | or about (0, 0) If more than one transformation then no marks |
| | | | | | | Total 4 marks |

| | | | | | | |
|-----------|--|---|--|-----|---|---|
| 15 | | e.g. $\pi \times 8.2^2 (= 211.24\dots, \frac{1681}{25}\pi)$ or $1.5 \times 1000 (= 1500)$ or $\pi \times 8.2^2 \times 10 (= 2112.4\dots, \frac{3362}{5}\pi)$ | | | 3 | M1 for a correct first step |
| | | e.g. $(1.5 \times 1000) \div (\pi \times 8.2^2) (= 7.1009\dots)$ or $(1.5 \times 1000) \div "2112.4" \times 10 \text{ oe} (= 7.1009\dots)$ or $10 - ((\text{"}2112.4\text{"} - 1.5 \times 1000) \div (\pi \times 8.2^2)) (= 7.1009\dots)$ | | | | M1 for a complete method to find the depth of the water or an answer of 2.89 – 2.91 |
| | | | | 7.1 | | A1 accept 7.09 – 7.11 |
| | | | | | | Total 3 marks |

| | | | | |
|-----------|--|----|---|----------------------|
| 16 | Ext $\angle = 180 - 162 (= 18)$ oe or $\frac{(n-2)180}{n} = 162$ oe | | 3 | M1 |
| | $360 \div "18"$ oe or $18n = 360$ | | | M1 |
| | | 20 | | A1 |
| | | | | Total 3 marks |

| | | | | | |
|-----------|-------|--|------------------------|---|----------------------|
| 17 | (i) | | 12, 18 | 1 | B1 |
| | (ii) | | 12, 14, 15, 16, 18, 20 | 1 | B1 |
| | (iii) | | 11, 13, 15, 17, 19 | 1 | B1 |
| | | | | | Total 3 marks |

| | | | | |
|---------------|---|---|---|--|
| 18 (a) | | 7 | 1 | B1 |
| (b) | e.g. $720 = 2 \times 360 = 2 \times 2 \times 180$ or $720 = 3 \times 240 = 3 \times 3 \times 80$ etc | | 3 | M1 At least 2 correct stages in prime factorisation |
| | 2, 2, 2, 2, 3, 3, 5 | | | M1 condone inclusion of 1 (may be a fully correct factor tree or ladder) |
| | | $2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5$ | | A1 dep on M2, accept $2^4 \times 3^2 \times 5$ |
| (c) | | 5 | 1 | B1 |
| | | | | Total 5 marks |

| | | | | | |
|---------------|--------------------------------|------|---|--|---------------------------------|
| 19 (a) | $4.25 \times 0.08 (= 0.34)$ oe | | 3 | M1 | M2 for 4.25×1.08 oe |
| | $4.25 + "0.34"$ | | | M1 | |
| | | 4.59 | | A1 SC: B1 for $4.25 \times 0.92 (= 3.91)$ oe | |
| (b) | $9.45 \div 108 (= 0.0875)$ oe | | 3 | M1 | M2 for $9.45 \div 1.08$ |
| | $9.45 \div 108 \times 100$ oe | | | M1 | |
| | | 8.75 | | A1 | |
| | | | | Total 6 marks | |

| | | | | |
|-----------|------------------------------|----|---|--|
| 20 | $7.5^2 - 6^2 (= 20.25)$ | | 4 | M1 OR for a correct trig statement involving one of the angles e.g. $\cos BAM = \frac{6}{7.5}$ or $\sin ABC = \frac{6}{7.5}$ where M is the midpoint of BC |
| | $\sqrt{7.5^2 - 6^2} (= 4.5)$ | | | M1 OR for a method to find one of the angles in the triangle e.g. $BAM = \cos^{-1}\left(\frac{6}{7.5}\right) (= 36.8\dots)$ or $ABC = \sin^{-1}\left(\frac{6}{7.5}\right) (= 53.1\dots)$ |
| | "4.5" \times 6 oe | | | M1 for a complete method to find the area of triangle ABC e.g. $2 \times \frac{1}{2} \times 7.5 \times 6 \times \sin("36.8")$ oe or $2 \times \frac{1}{2} \times 7.5 \times \sqrt{7.5^2 - 6^2} \times \sin("53.1")$ oe |
| | | 27 | | A1 cao |
| | | | | Total 4 marks |

| | | | | |
|-----------|--|----|---|----------------------|
| 21 | $10 \times 79.2 (= 792)$ or $3 \times 68 (= 204)$ | | 3 | M1 |
| | $(10 \times 79.2 - 3 \times 68) \div 7$ | | | M1 |
| | | 84 | | A1 |
| | | | | Total 3 marks |

| | | | | | |
|-----------|-----|--|-------------|---|---|
| 22 | (a) | | t^6 | 1 | B1 |
| | (b) | | w^{12} | 1 | B1 |
| | (c) | | $125x^3y^6$ | 2 | B2 (B1) for 2 correct terms as part of a product |
| | | | | | Total 4 marks |

| | | | | | |
|-----------|---|------|---|--|---------------------------|
| 23 | $22 \times 60 \times 60 (= 79\,200)$ oe or $22 \div 1000 (= 0.022)$ oe | | 3 | M1 for converting from m/s to m/h or from m to km | M2 for 22×3.6 oe |
| | $22 \times 60 \times 60 \div 1000$ oe | | | M1 for a complete method | |
| | | 79.2 | | A1 oe, dep on at least M1 | |
| | | | | | Total 3 marks |

| | | | | | | |
|-----------|---|--|----|---|----|--|
| 24 | $15 - 3 : x - 3 = 2 : 7$ or $(15 - 3) \div 2 (= 6)$ | $(n =) (15 - 3) \div \frac{2}{2+7} (= 54)$ where n is the total age 3 years ago | | 3 | M1 | M2 for $\frac{(15-3) \times 7}{2} (= 42)$ |
| | $\frac{x-3}{15-3} = \frac{7}{2}$ oe or $7 \times "6" (= 42)$ | $"54" \times \frac{7}{2+7} (= 42)$ | | | M1 | |
| | | | 45 | | A1 | |
| | | | | | | Total 3 marks |

| | | | | |
|-----------|--|-----|---|--|
| 25 | $105 \div (5 \times 4) (=5.25)$ oe or $105 \div (4 \times 3) (=8.75)$ oe or $105 \div (3 \times 5) (=7)$ | | 3 | M1 |
| | "8.75" – "5.25" | | | M1 dep on previous M1. If M1 gained and they have worked out 3 pressures, award M1 for their highest minus their lowest. |
| | | 3.5 | | A1 oe |
| | | | | Total 3 marks |

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