

GCSE MATHEMATICS

Topic tests - Foundation tier - Mark schemes



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Algebra

| Q | Answer | Mark | Comments |
|------|--|------|---|
| 1(a) | (4, 5) | B1 | |
| 1(b) | Plots B at (2, 0) | B1 | SC1 (5, 4) given as answer to part (a) and B plotted at (0, 2) |
| 1(c) | Plots (x, y) where $x + y = 6$ | B1 | |
| 2(a) | $5w$ | B1 | |
| 2(b) | 9 | B1 | |
| 2(c) | $3y = 9$ | M1 | |
| | 3 | A1 | Embedded '3' with wrong or no answer M1 A0 |
| 3(a) | $3x - 18$ | B1 | |
| 3(b) | $5(y - 2)$ | B1 | |
| 3(c) | $12w + 3 - 15w + 10$ $(12w + 3) - (15w - 10)$ | M1 | Allow one sign or arithmetic error for M1 |
| | $12w + 3 - 15w + 10$ | A1 | A1 If all correct |
| | $-3w + 13$ | A1ft | ft their expansion if M awarded Ignore any non-contradictory further work, such as solving an equation, but do not award A1 if contradictory further work, such as $= 10w$ |
| 4(a) | 7 | B1 | |
| 4(b) | Points correctly plotted | M1 | ft from their table |
| | Correct line drawn for $-1 \leq x \leq 3$ | A1 | |

| Q | Answer | Mark | Comments |
|---|---|------|--|
| 5 | A = 6 | B1 | |
| | B = 5 | B1ft | $(22 - 2 \times \text{their A}) \div 2$ |
| | C = 10 | B1ft | $26 - \text{their A} - 2 \times \text{their B}$ |
| | D = 7 | B1ft | $28 - \text{their A} - \text{their B} - \text{their C}$ |
| 6 | Alternative method 1 | | |
| | 25 – 17 or 8 or –8 | M1 | oe |
| | 17 – their $8 \div 2 \times 3$ or 25 – their $8 \div 2 \times 5$ | M1 | |
| | 5 | A1 | SC1 –7 |
| | Alternative method 2 | | |
| | Difference of 4 seen or 9 or 13 or 21 in correct position on line | M1 | |
| | 9 and 13 in correct position or 3 subtractions of 4 from 17 with at most 1 error | M1 | |
| | 5 | A1 | SC1 –7 |
| 7 | Substitutes $x = 5$ into equation | M1 | $2a (=) 20 - b$ |
| | A correct pair of values | A1 | eg (0, 20) (1, 18) (2, 16) (3, 14) etc Allow negative integers for either value |
| | A second pair of correct values | A1 | |


Number

| Q | Answer | Mark | Comments |
|------|---|------|---|
| 1(a) | 323 | B1 | |
| 1(b) | 155 | B1 | |
| 1(c) | 520 | B1 | |
| 1(d) | 23 | B1 | |
| 2(a) | 27 | B1 | |
| 2(b) | 31 | B1 | |
| 3 | 25 (%) | B1 | |
| | 0.4(0) | B1 | |
| | $\frac{9}{10}$ | B1 | oe fraction eg, $\frac{90}{100}$ |
| 4(a) | 0.6×35 | M1 | oe or build up method |
| | 21 | A1 | SC1 14 |
| 4(b) | $150 \div 5 \times 4$ | M1 | oe or 30 seen |
| | 120 | A1 | |
| 5(a) | $\sqrt{81}$ | B1 | |
| 5(b) | $2^5 = 32$ or $5^2 = 25$ | B1 | |
| | $2 \times 2 \times 2 \times 2 \times 2 = 32$ and $5 \times 5 + 2 + 5 = 32$ | B1 | |
| 6 | 30 or 5 | M1 | Allow 30.0 or 5.0 |
| | 150 | A1 | Allow [145, 156] but not 153.92 rounded |

| Q | Answer | Mark | Comments |
|---|---|--------|---------------------------|
| 7 | Alternative method 1 | | |
| | 2200 – 1600 (= 600) | M1 | |
| | $\frac{\text{their } 600}{1600} \times 100$ | M1 dep | |
| | 37.5 | A1 | |
| | Alternative method 2 | | |
| | $\frac{2200}{1600} (= 1.375)$ | M1 | |
| | (Their 1.375 – 1) × 100 | M1 dep | (Their 1.375 × 100) – 100 |
| | 37.5 | A1 | |

| | | | |
|---|--|------|--|
| 8 | Alternative method 1 | | |
| | 0.84 | B1 | oe $\frac{84}{100}$ |
| | 17 ÷ 20 attempted | M1 | $\frac{17 \times 5}{20 \times 5}$ |
| | 0.85 | A1 | $\frac{85}{100}$ |
| | $\frac{17}{20}$ selected and 0.84 and 0.85 | Q1 | oe QWC - Strand (iii) - Writing both as decimals or percentages or both as fractions with same denominator and correct decision for their working |
| | Alternative method 2 | | |
| | 0.84 | B1 | oe $\frac{84}{100}$ |
| | $\frac{\text{their } 84 \div 5}{20}$ | M1 | |
| | $\frac{16.8}{20}$ | A1ft | ft B0 M1 |
| | $\frac{17}{20}$ selected and $\frac{16.8}{20}$ | Q1 | QWC - Strand (iii) - Writing both as a fraction with 20 as denominator and correct decision for their working |

Probability and statistics

| Q | Answer | Mark | Comments |
|------|--|------|--|
| 1(a) | 4 | B1 | |
| 1(b) | 5 (+) 3.5 (+) 6 (+) 1.5 or 16 seen or one of $3.5 \times (a)$ $6 \times (a)$ $1.5 \times (a)$ or any number \times their (a) | M1 | oe |
| | Their 16 \times their 4 or 20 + their 11 \times their 4 or their (20) + their 14 + their 24 + their 6 | A1 | |
| | 64 | A1ft | Unless key = 1 ft their key \times 16 or ft 20 + their key \times 11 |
| 2(a) | Impossible Unlikely | B2 | B1 One correct in correct position SC1 0 and $\frac{1}{6}$ |
| 2(b) |  | B3 | Accept clear indication of C at $\frac{1}{8}$, A at $\frac{2}{8}$ and B at $\frac{5}{8}$ B2 Any two correct B1 Any one correct |
| 3(a) | Writes numbers in order of size 20 21 23 23 24 (25 25 25 31) or 31 25 25 25 24 (23 23 21 20) | M1 | Allow one error/omission/extra |
| | 24 | A1 | |
| 3(b) | 25 | B1 | |

| Q | Answer | Mark | Comments |
|------|---|------|---|
| 4(a) | $1 - 0.2 - 0.15 - 0.3$ | M1 | $1 - 0.65$ |
| | 0.35 | A1 | oe |
| 4(b) | 0.5 | B1 | oe |
| 4(c) | Alternative method 1 | | |
| | 200×0.15 or $\frac{30}{200}$ | M1 | oe |
| | 30 | A1 | SC1 170 |
| | Alternative method 2 | | |
| | $200 - (200 \times 0.2 + 200 \times 0.3 + 200 \times \text{their } 0.35)$ | M1 | |
| | 30 | A1 | SC1 170 |
| 5(a) | $21 + 20 + 29 + 22 + 24$ or 116 | M1 | Allow one error or omission |
| | Their total $\div 5$ | M1 | Condone $21 + 20 + 29 + 22 + 24 \div 5$ |
| | 23.2 | A1 | May be implied |
| | 23 | B1ft | ft any decimal seen that is correctly rounded |
| 5(b) | 9 | B1 | |
| 6(a) | 13 | B1 | |
| 6(b) | Cannot tell | B1 | |
| 6(c) | $20 < x \leq 30$ | B1 | |

Problem solving

| Q | Answer | Mark | Comments | | | | | | | | | |
|------|--|------|--|------|------|--|------|------|------|-----|----|---|
| 1 | (£)3.60(p) or 360p in total column | B1 | Condone 3.60 but not 360 without units | | | | | | | | | |
| | (£)1.20(p) or 120p in first column | B1ft | Ft their cost of coffees ÷ 3 | | | | | | | | | |
| 2(a) | $1 + 2 \times 4$ or $1 + 4 \times 2$ or $4 + 1 \times 5$ or $4 + 5 \times 1$ or $5 + 4 \times 1$ or $5 + 1 \times 4$ | B1 | | | | | | | | | | |
| 2(b) | $4 \times 3 - 1 \times 5$ or $4 \times 3 - 5 \times 1$ or $5 \times 3 - 2 \times 4$ or $5 \times 3 - 4 \times 2$ 3 is placed in question so other answers are irrelevant | B2 | B1 For any correct expression ie not using given numbers or repetition or correct expression but with '3' moved from position eg $3 \times 5 - 1 \times 8$ $3 \times 3 - 1 \times 2$ Negative answer B0 | | | | | | | | | |
| 2(c) | $3 + 4 + 5 = 12$ | B2 | B1 For any correct expression using 'incorrect' digits eg 0 or repeating digits eg $1 + 4 + 5 = 10$ | | | | | | | | | |
| 3 | <table border="1" style="margin-left: auto; margin-right: auto;"> <tbody> <tr> <td>$3x$</td> <td>$4x$</td> <td>$5x$</td> </tr> <tr> <td>$2x$</td> <td style="background-color: #d2b48c;"></td> <td>$6x$</td> </tr> <tr> <td>$7x$</td> <td>$4x$</td> <td>x</td> </tr> </tbody> </table> <p>Completely correct table</p> | $3x$ | $4x$ | $5x$ | $2x$ | | $6x$ | $7x$ | $4x$ | x | B3 | B2 $4x$ and $5x$ on top row in that order or $7x$ and $4x$ on bottom row in that order B1 A row or column that adds to $12x$ |
| $3x$ | $4x$ | $5x$ | | | | | | | | | | |
| $2x$ | | $6x$ | | | | | | | | | | |
| $7x$ | $4x$ | x | | | | | | | | | | |
| 4 | (4 small =) 3 large | M1 | $4 : 3$ $8 \times \frac{3}{4}$ $9 \times \frac{2}{3}$ $9 \div 1.5$ | | | | | | | | | |
| | 6 | A1 | | | | | | | | | | |

| Q | Answer | Mark | Comments |
|---|---|------|--|
| 5 | Alternative method 1 | | |
| | $x + x + 4 + x + 8 + x + 12 (= 100)$ | M1 | Any letter |
| | $4x + 24 = 100$ | M1 | Correct simplification of their four algebraic terms |
| | 19 | A1 | |
| | Alternative method 2 | | |
| | Trial with four numbers in correct pattern with correct total | M1 | eg $10 + 14 + 18 + 22 = 64$ |
| | Trial with a different four numbers in correct pattern with correct total, which is closer to 100 | M1 | eg having tried $10 + 14 + 18 + 22 = 64$, tries $20 + 24 + 28 + 32 = 104$ |
| | 19 | A1 | |
| | Alternative method 3 | | |
| | $4 + 8 + 12 (= 24)$ | M1 | $6 \times 4 (= 24)$ |
| | $(100 - \text{their } 24) \div 4$ | M1 | $76 \div 4$ |
| | 19 | A1 | |
| | Alternative method 4 | | |
| | $(100 \div 4 =) 25$ | M1 | |
| | Their $25 - 6$ | M1 | |
| | 19 | A1 | |
| | Alternative method 5 | | |
| | Trial with four numbers in correct pattern with correct total | M1 | eg $10 + 14 + 18 + 22 = 64$ |
| | $(100 - \text{sum of their four numbers}) \div 4 + \text{their lowest number}$ | M1 | eg $(100 - 64) \div 4 + 10$ |
| | 19 | A1 | |

| Q | Answer | Mark | Comments |
|------|---|-------|--|
| 6 | 1275 – 1 or 1274 or 1275 + 51 or 1326 | M1 | |
| | 1325 | A1 | |
| 7(a) | 4 × 2 or 6 × 4 – (4 × 4) or 4 × 4 ÷ 2 | M1 | |
| | 8 | M1 | SC1 Shows shaded rectangle is 4 by 2 on diagram or SC1 Shows large rectangle is 6 by 4 on diagram (6 could be 1, 4, 1) |
| 7(b) | 3.5 or 7 seen | B1 | |
| | 4 × their 3.5 + 4 × 4 + 4 (× 1) | M1 | oe eg 2 × their 7 + 4 × 4 + 4 (× 1) Condone including 3 or 4 internal edges |
| | 34 | A1ft | ft their 3.5 No extra edges |
| 8 | $x + x + 3 + x + x + 3 (= 37)$ | M1 | oe (2x + 3) × 2 condone missing brackets 37 – 6 |
| | $4x + 6 = 37$ or $4x = 37 - 6$ | M1dep | oe $\frac{37-6}{4}$ |
| | (x =) 7.75 | A1 | oe |

Real life

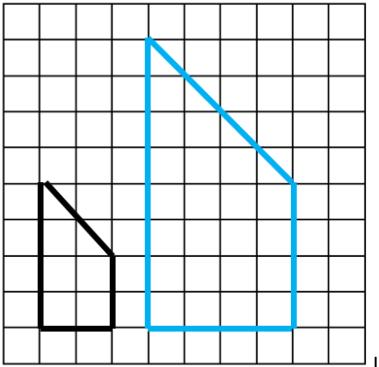
| Q | Answer | Mark | Comments | |
|------|--|------|--|--|
| 1(a) | 160 | B1 | | |
| 1(b) | Fully correct explanation eg 1 (Measures) 300 (ml and then) 200 (ml) eg 2 (Uses) 250 (ml) twice | Q2 | Q1 Partially correct explanation eg 1 Fills the jug and then adds some more eg 2 Uses the jug twice QWC strand (ii) | |
| 2 | $9.70 + \frac{9.70}{2}$ oe | M1 | 14.50 – 9.70 (= 4.80 and 9.70 ÷ 2 (4.85) | 9.70 ÷ 2 (= 4.85) and 14.50 – their 4.85 (= 9.65) |
| | or $9.70 + 4.85$ oe | | | |
| | or 9.7×1.5 oe | | | |
| | 14.55 and no oe | A1 | 4.80 and 4.85 and No | (4.85 and) 9.65 and No |
| 3 | 600 and 50 and 200 | B3 | B2 For any two of 600, 50, 200 B1 For any one of 600, 50, 200 or for sight of $\frac{2}{3}$ or $\frac{3}{2}$ oe or for sight of 2 : 3 or 3 : 2 oe Accept 66%, 67%, 150% If no correct values seen B1 For any correct proportion eg Potatoes = 3 × stock Potatoes = 12 × carrots Stock = 4 × carrots | |

| Q | Answer | Mark | Comments |
|------|--|--------|--|
| 4 | 26×135 or 3510 or 35.1(0) | M1 | |
| | $(967 - 135) \times 19.5$ or 16224 or 162.24 | M1 | |
| | Their 35.10 + their 162.24 | M1 | Can work in pence here 3510 + 16224 |
| | 197.34 and Yes | A1 | or 19734 p and 20000 p seen and Yes |
| | Organised response at working out cost of all units + conclusion | Q1 | Strand (iii) - Clear working with all 3 method marks gained and conclusion May have incorrect units |
| 5(a) | $280 \div 4$ | M1 | |
| | Kiwi = 70 | A1 | |
| | Yogurt = 210 | A1 ft | ft 280 – their 70 Allow their 70×3 if M1 awarded SC1 For 35 and 105 |
| 5(b) | Alternative method 1 | | |
| | $72 \times \frac{30}{100}$ (= 21.6) | M1 | |
| | $72 +$ their 21.6 or 22 | M1 Dep | |
| | 93.6 or 94 | A1 | |
| | 94 pence or £0.94 | Q1 | Strand (i) - Correct money notation ft their 93.6 rounded to nearest integer SC3 For 93p with no working |
| | Alternative method 2 | | |
| | 1.3 seen | M1 | |
| | 72×1.3 | M1 | |
| | 93.6 or 94 | A1 | |
| | 94 pence or £0.94 | Q1 | Strand (i) - Correct money notation ft their 93.6 rounded to nearest integer SC3 For 93p with no working |

| Q | Answer | Mark | Comments |
|---|--|------|--|
| 6 | 0.3×70 or $\frac{30}{100} \times (120 - 50)$ or 30×70 or (£)21 or 2100 | M1 | oe |
| | 40 + their 21 | M1 | Cost with Vijay's vans Allow inconsistent units here |
| | 0.48×120 | M1 | |
| | 61 and 57.6(0) | A1 | Cost with U-drive |
| | A correct conclusion based on their working if all method marks are awarded. (U-Drive if correct working) | Q1 | Organised response leading to a correct conclusion QWC Strand (iii) |

Shape

| Q | Answer | Mark | Comments |
|------|---------------------------------|------|--|
| 1(a) | [31, 35] | B1 | |
| 1(b) | [133, 137] | | |
| 2(a) | Zoo | B1 | Accept Z |
| 2(b) | Hospital | B1 | Accept H |
| 2(c) | [063, 067] | B2 | B1 For [63, 67] or 062 or 068 SC1 For [243, 247] |
| 3 | 6 correct faces | B3 | B2 For 4 or 5 correct faces B1 For 2 or 3 correct faces |
| 4 | $\frac{1}{2} \times 5 \times 8$ | M1 | oe |
| | 20 | A1 | |
| 5(a) | 105 | B1 | |
| 5(b) | $360 - (100 + 150)$ | M1 | oe Condone invisible brackets |
| | 110 | A1 | |

| Q | Answer | Mark | Comments |
|------|--|------|--|
| 6(a) |  | B2 | Shape can be anywhere B1 For basic shape maintained and 2 correct sides |
| 6(b) | Evidence of counting squares or 6×4 | M1 | $0.5 \times 4 \times (8 + 4)$ |
| | 24 | A1ft | ft their shape if B1 awarded in (a) |
| 7(a) | $6 \times 3 \times 12$ | M1 | |
| | 216 | A1 | |
| | cm^3 or ml | B1 | SC2 2.16 m^3 with no working |
| 7(b) | $54 \div 6 (= 9)$ | M1 | |
| | $\sqrt{(\text{their } 9)}$ | M1 | $3 \times 3 = 9$ |
| | $\frac{12}{\text{their } 3} \times \frac{6}{\text{their } 3} \times \frac{3}{\text{their } 3}$ | M1 | Allow $\frac{(\text{their } 216)}{27}$ |
| | 8 | A1 | |

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. |
| ft | Follow through marks. Marks awarded for correct working following a mistake in an earlier step. |
| SC | Special case. Marks awarded within the scheme for a common misinterpretation which has some mathematical worth. |
| M dep | A method mark dependent on a previous method mark being awarded. |
| B dep | A mark that can only be awarded if a previous independent mark has been awarded. |
| oe | Or equivalent. Accept answers that are equivalent. eg, accept 0.5 as well as $\frac{1}{2}$ |
| [a, b] | Accept values between <i>a</i> and <i>b</i> inclusive. |
| 3.14... | Allow answers which begin 3.14 eg 3.14, 3.142, 3.149. |
| Use of brackets | It is not necessary to see the bracketed work to award the marks. |

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