



GCSE MARKING SCHEME

SUMMER 2022

GCSE
MATHEMATICS – COMPONENT 1
(FOUNDATION TIER)
C300U10-1

INTRODUCTION

This marking scheme was used by WJEC for the 2022 examination. It was finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conference was held shortly after the paper was taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conference, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about this marking scheme.

EDUQAS GCSE MATHEMATICS

SUMMER 2022 MARK SCHEME

| Component 1: Foundation Tier | Mark | Comment |
|---|------|--|
| 1. (a)(i) | | |
| 1200 | B1 | |
| 1. (a)(ii) 0.6(00) | B1 | Ignore trailing zeros; |
| | | Accept $\frac{6}{10}$ oe |
| 1. (a)(iii) 22 | B1 | |
| 1. (a)(iv) 13 | B1 | |
| 1. (b)(i) 44(%) | B1 | |
| 1. (b)(ii) 0.87 | B1 | |
| 1. (c) 7 | B1 | Accept ± 7 ; allow -7 ; Do not accept $7 \times 7 = 49$ or just 7×7 |
| | (7) | |
| 2. (a) likely and no others options indicated | B1 | |
| 2. (b)(i) | | |
| Arrow marked at 0 | B1 | Allow clear intention to indicate 0 |
| 2. (b)(ii) Arrow marked at $\frac{1}{3}$ | B1 | Allow clear intention to indicate $\frac{1}{3}$ |
| | (3) | |
| 3. (a) 0.315 indicated | B1 | |
| 3. (b) (48 ÷ 4 =) 12 | B1 | May be embedded |
| (45 ÷ 5) × 2 | M1 | |
| 18 | A1 | May be embedded; 80 + 12 - 18 or 80 - 18 + 12 earns B1 M1 A1 |
| (80 + 12 – 18 =) 74 | B1 | FT 'their derived 12' and 'their derived 18' |
| | (5) | |

| 4. (a) | Girl Boy | | Rows could be in any order; letters could be lower case |
|--------|---|-----|---|
| | P T P W R T R W S T S W Z T Z W | B2 | B1 for any 4 or 5 of the remaining 6 rows with no incorrect rows; OR for all 6 remaining rows with extra rows; For B2 they must only have the correct 6 expected rows except B2 can also be awarded if all 6 correct expected rows are given and the 2 given rows are repeated AND 8 outcomes indicated in (b) e.g. by a fraction with denominator 8. |
| 4. (b) | $\frac{1}{8}$ oe | B1 | FT 'their $\frac{1}{8}$ ' provided they have at least 4 correct added rows; Allow e.g. 0.125 or 12.5% but B0 for e.g. 1 in 8 or 1 : 8 |
| | | (3) | |
| 5. (a) | (-2, 5) | B1 | |
| 5. (b) | <i>D</i> marked at (−2, −1) and <i>CD</i> = 5 (cm) | B2 | Tolerance ±2 mm B1 for <i>D</i> marked at (–2, –1) OR B1STRICT FT for 'their length <i>CD</i> ', Allow unambiguous mark at (–2, –1) |
| | | (3) | 7 mow anamoigadas mark at (2, 1) |
| 6. (a) | 2.5 × 10 + 16 oe, si | M1 | |
| | 41 (minutes) | A1 | |
| 6. (b) | (26 – 16) ÷ 2.5 oe, si | M1 | implied by e.g. '26 $-$ 16 = 10, 2.5 \times 4 = 10' or '2.5 \times 4 = 10, 10 + 16 = 26'; build-up method may be used to find 10 |
| | 4 (kebabs) | A1 | Accept $26 = 2.5 \times 4 + 16$ for A1 provided there is no contradiction of 4 |
| | | (4) | |

| 7 () | | 1 | T |
|---------|---|-----|---|
| 7. (a) | (300÷100)×8 oe | M1 | Full method; may be in stages; may be a build-up method e.g. '1% = 3, 2% = 3 + 3, 4% = 6 + 6, 8% = 12 + 12' or '10% = 30, 5% = 15, 1% = 3, 15 + 9' |
| | (£)24(.00) | A1 | Allow £24.00p or 2400p; |
| | | | mark final answer |
| 7. (b) | $(15 \div 3 =) (£)5(.00)$ oe | B1 | If units are given they must be correct; |
| | $8 \div 10 \times 6$ or $800 \div 10 \times 6$ oe | M1 | May be a build-up method e.g. 10% = 0.80, 50% = 4, 10% + 50 % = 0.80 + 4; |
| | | | Allow for $\frac{60}{100} \times 800$ or $\frac{60}{100} \times 8$ |
| | (£)4.8(0) or 480(p) | A1 | CAO; implies M1 |
| | (4.80 + 5 =) (£)9.8(0) or 980(p) | B1 | FT 'their 5' + 'their 4.8(0)' providing correct method shown for each |
| | | | Allow £9.80p; correct answer implies 4 marks provided not from wrong working; |
| | | | mark final answer |
| Alterna | ative method | | |
| | $(15 \div 3 \times 2 =) (£)10(.00)$ oe | B1 | |
| | 8 ÷10 ×4 or 800 ÷10 ×4 oe | M1 | May be a build-up method e.g. 10% = 0.80, 50% = 4, 50% - 10% = 4 - 0.80; |
| | | | Allow for $\frac{40}{100} \times 800$ or $\frac{40}{100} \times 8$ |
| | (£)3.2(0)or 320(p) | A1 | CAO; implies M1 |
| | (15 + 8 - 10 - 3.20 =) (£)9.8(0) or 980(p) | B1 | FT 23 – 'their 10' + 'their 3.2(0)' providing correct method shown for each |
| | | | Allow £9.80p; correct answer implies 4 marks provided not from wrong working; |
| | | | mark final answer |
| | | (6) | |

| 8. (a) | | | |
|--------|---------------------------------|-----|---|
| 0. (a) | 9 × 6.5 oe, si | M1 | May be in stages; may be a build-up method but must clearly be for 9×6.5 not e.g. 9×6 |
| | (£)58.5(0) | A1 | CAO |
| 8. (b) | 314-160 14 oe, si | M2 | May be in stages; may use a build-up approach to find how many 14's are in 154 M1 for sight of 314 – 160 (= 154) |
| | (£) 11(.00 per hour) | A1 | CAO |
| | | (5) | |
| 9. (a) | <i>x</i> + 8 | B1 | mark final answer; |
| 9. (b) | $6 \times x + 10(x + 8)$ | M1 | FT 'their $x + 8$ ', need not be binomial |
| | $6 \times x + 10 \times x + 80$ | M1 | FT 'their $x + 8$ ', providing it is binomial |
| | 16 <i>x</i> + 80 | A1 | FT 'their $6x + ax + b$ ', for non-zero a, b ; ignore attempts to factorise after correct answer seen; |
| | | | If no marks award SC2 for $(6x + 6(x + 8) \rightarrow) 6x + 6x + 48$ and $12x + 48$ or $(10x + 6(x + 8) \rightarrow) 10x + 6x + 48$ and $16x + 48$ or $(10x + 10(x + 8) \rightarrow) 10x + 10x + 80$ and $20x + 80$ |
| | | | or award SC1 for the correct expansion of '10×their($x + 8$)' providing their($x + 8$) is binomial or for the correct expansion of $10(x + 8)$ or $6(x + 8)$ |
| | | (4) | |
| 10. | (2 ³ =) 8 si | B1 | |
| | $(6^2 =) 36 \text{ si}$ | B1 | |
| | $\frac{2}{9}$ final answer | B1 | FT 'their 8' simplified to a fraction in lowest terms; |
| | | | NB B0 if 'their 8' is already in lowest terms |
| | | (3) | |

| 11. (a) 12, 13, 14, 14, 17 OR 12, 14, 14, 15, 17 OR 12, 14, 14, 16, 17 | B2 | Ages can be in any order for B2 B1 for a correct interpretation of the range or mode si e.g. eldest child 17 indicated and no child younger than 12 given (range) or more than 1 child aged 14 indicated and no other mode (mode) |
|--|-----|---|
| 11. (b) Uses only the cost of 1 Mega Burger, 1 Chicken Burger 1 Fish Pie, 1 Vegetarian Lasagne | B1 | e.g. does not include the £7(.25) and £6(.30) in their calculation for the bill |
| Uses an appropriate calculation e.g. 9+9+10+7 or 48-7-6 or 50-8-7 | M1 | FT 'their 4 list choices'; allow one incorrect estimate out of 4 or 6 e.g. $9+9+9+7$ or $9+7.20+9+6.30+9.90+6.80$ allow e.g. $9+7+9+6+10+7$ OR rounding to the nearest 10p e.g. $9+9+9.9+6.8$ or $9+7.30+9+6.80+9.90+6.80$ OR rounding to the nearest 50p e.g. $9+7.50+9+6.50+10+7$ |
| (£)35(.00) | A1 | CAO; does not imply M1; not from wrong working if B0 M1 award SC1 for (£)35(.00) (from e.g. 9 + 7 + 9 + 10 discarding the two cheapest items) or for (£)48(.00) (from e.g. 9 + 7 + 9 + 6 + 10 + 7) or for (£)49(.00) (from 9 + 7.50 + 9 + 6.50 + 10 + 7) |
| | (5) | |

| 12. (a) | 432 ÷ 12 | M1 | May be awarded for a convincing build up method e.g. counting on in 12s |
|---------|--|-----|--|
| | £)36 | A1 | |
| 12. (b) | | | |
| | Sight of $(30 \times 20 =) 600(p)$ or $(30 \times 0.2(0) =) (£)6(.00)$ | B1 | |
| | Sight of 500 \times 14 or 500 \times 0.14 oe | M1 | Accept 5 × 14; may be implied |
| | 7000(p) or (£)70(.00) | A1 | CAO |
| | (7000 + 600 =) 7600(p) or (70.00 + 6.00 =) (£)76(.00) | B1 | FT 'their 500×14 ' + 'their derived 6' oe, providing M1 awarded and 30×20 oe attempted; may be implied in later work; |
| | (VAT =) 380(p) or (£)3.8(0) | B1 | FT 5% of 'their 7600' or 'their 76(.00)' providing that 'their 7600 or 76' is from an attempt to sum both the fixed charge and electricity for 30 days |
| | | | may be embedded e.g. B1 for 7600 + 380 |
| | 7980(p) or (£)79.8(0) ISW | B1 | FT providing previous B1 B1 awarded; if units are stated they must be correct; correct answer implies previous B1 |
| | | (8) | |

| 13. | | | | | |
|-----|---|------|---|---|--|
| 13. | 44 | | | | |
| | $(\frac{1}{2} \text{ pt} =) 300 \text{ ml or } 500 \text{ ml} = \frac{5}{6} \text{ pt si}$ | | | | |
| | or uses a common multiple of 600 and 500 or 300 and 500 | B1 | Allow for 600 ml | | |
| | Valid method of comparison | M1 | Allow for use of | , , | nl conversion |
| | valid method of comparison | IVII | e.g. 1 litre = 1.7 | | |
| | | | Examples of val | | |
| | | | | Glass | Bottle |
| | | | per 100 ml | 150 ÷ 3 | 200 ÷ 5 |
| | | | per 3000 ml | 10 × 1.5(0) | 6 × 2 |
| | | | $\frac{5}{6}$ pt/ 500 ml | 1.50 ÷ 3 × 5 | (2) |
| | | | $\frac{3}{6}$ pt / 300 ml | (1.50) | 2 ÷ 5 × 3 |
| | | | ml per 50p | 300 ÷ 3 | 500 ÷ 4 |
| | | | ml per p | 300 ÷ 150 | 500 ÷ 200 |
| | | | ml per £6 | 300 × 4 | 500 × 3 |
| | | | or (Glass) 150 ÷ 3 per 100 or (Bottle) 200 ÷ 5 per 100 | | |
| | | | For the M1 igno calculations are | | g as the |
| | | | M0 for consideri capacity/cost | ng the differen | ce in |
| | Accurate comparison showing bottle is better value | A1 | FT 'their convers | | |
| | | | • | Glass | Bottle |
| | | | per 100 ml | 50(p) | 40(p) |
| | | | per 3000 ml | (£)15 | (£)12 |
| | | | $\frac{5}{6}$ pt/ 500 ml | (£)2.50 | (£2) |
| | | | $\frac{3}{6}$ pt / 300 ml | (£1.50) | (£)1.20 |
| | | | ml per 50p | 100 | 125 |
| | | | ml per p | 1200 | 2.5 |
| | | | ml per £6 | 1200 | 1500 |
| | | | or (Glass) 50 p per or (Bottle) 40 p per Units may be mi then be in the sa If units are state | 100 ml and 40 issing but the vame unit. | $0p \times 3 = £1.20$ ralues stated must |
| | | | correctly. | | |
| | | (3) | | | |
| | | / | | | |

| 14.(a)(i) | | |
|--|----------|--|
| 9:7 | B2 | B1 for sight of any simplified ratio not in simplest form or for 7 : 9; allow non-integer values for B1 |
| | | NB 45000 : 35000 is B0 |
| 14. (a)(ii) $21000 \div 7 \times 9 - 21000 \\ (= 27000 - 21000) \text{ oe si}$ or $21000 \div 7 \times (9 - 7) \\ (= 3000 \times 2) \text{ oe si}$ | M2 | For M2 or M1, allow 45000 and 35000 used correctly or any correct ratio whether in simplest form or not OR FT 'their 9 : 7', providing B1 awarded in (a)(i) M1 for $21000 \div 7 \times 9$ (= 27000) oe or $21000 \div 7 \times 16 - 21000$ (= 27000) oe or $21000 \div 7 \times 16$ (= 48000) oe |
| (£)6000 | A1 | CAO |
| 14. (b) | | |
| 21 000 + (35 000 ÷ 10) × 3 oe, si (£)31 500 | M1 A1 | (= 21 000 + 10 500); may be in stages |
| | (7) | |
| 15. $t-5 = 3n \text{ oe, si}$ or $\frac{t}{3} = \frac{5}{3} + n$ | B1 | Isolates term in n ; allow e.g. $-3n = 5 - t$ or correctly divides through by 3 |
| $n = \frac{t-5}{3}$ or $\frac{t}{3} - \frac{5}{3} = n$ oe | B1 | May be unsimplified; allow e.g. $n=(t-5) \div 3$ or $n=\frac{5-t}{-3}$ If no marks, award SC1 for $n=\frac{t+5}{3}$ or $\frac{t-5}{3}$ (subject omitted) |
| | (2) | |
| | (4) | |

| 16. (a) | Valid explanation e.g. 'Alternate angles (between parallel lines)' | E1 | Allow 'Alt' but not 'Alternative', not 'Alternating'; ignore correct embellishments such as Z angles; do not ignore incorrect embellishments E0 for e.g. 'It is congruent to angle <i>P'</i> without any justification |
|---------|---|-----|---|
| 16. (b) | $P\widehat{Q}R = (100^{\circ} + 20^{\circ} =) 120^{\circ}$ (Angles on a straight line (sum to 180)) | B1 | Angles may be seen on the diagram; degrees symbol may be omitted North North 100° 100° 20° 10 km |
| | $Q\widehat{P}R = 30^{\circ}$ (Base angles of an isosceles triangle (are equal)) | B1 | FT 'their $P\hat{\mathbb{Q}}R'$ |
| | (Bearing =) 130° | B1 | |
| | At least one correct reason stated appropriately | E1 | |
| | | (5) | |

| 17. (a) $1 - \left(\frac{6}{14} + \frac{5}{14}\right) \text{ oe, si}$ $\frac{3}{14} \text{ or equivalent fraction}$ | M2 A1 | M1 for $\frac{6}{14} + \frac{5}{14}$ oe, si If M1 A0, award SC1 for a final answer of $\frac{11}{14}$ or equivalent fraction |
|---|----------|---|
| 17. (b) 540 (minutes) or (324 ÷ 60) × 5 ÷ 3 oe 9 (hours) | B2 B1 | may be seen in stages B1 for $(324 \div 3) \times 5$ oe or for $324 + (324 \div 60) \times 40$ (= $324 + 216$) oe OR for $(324 \div 60) \times 5$ oe or for $(324 \div 60) \div 3$ oe OR for sight of $(324 \div 60) \div 3$ oe OR for sight of $(324 \div 60) \div 3$ marks provided not from wrong working. If no marks, award SC1 for their derived time in minutes converted correctly to hours; their time in minutes and the division by 60 must be seen |
| | (6) | |

| 18. (a) | | | |
|---------|--|-----|---|
| | Valid criticism e.g. 'There should be no gaps between the bars.' | E1 | Allow e.g. 'Some of the values overlap.' or 'There should not be gaps.' or 'The bars should all touch.' or 'The 12.4 appears on two bars.' or 'They have the same numbers twice.' or 'The bars should be together.' |
| | | | Ignore irrelevant embellishments but do not allow a contradiction or an incorrect statement e.g. 'It goes 12 to 12.4 and then 12.4 again. It should have gone on to 12.5' is E0 |
| 18. (b) | | | Question requires working to be shown |
| | (Frequencies of) 9, 12, 4, 5 si | B1 | |
| | At least 1 of $9 \times (360 \div 30)$ $12 \times (360 \div 30)$ $4 \times (360 \div 30)$ $5 \times (360 \div 30)$ | M1 | FT 'their frequencies'; allow for e.g. 9×12 ; allow for $360 \div 30 = 12$ and sight of one correct angle e.g. 108 or sight of at least 2 correct angles |
| | For at least 3 of (Angles) B 108, F 144, W 48, C 60 | M1 | |
| | Correct, labelled pie chart with no incorrect angles seen in working | A2 | Allow tolerance of ±2° for all angles; |
| | Ç Ç | | Lines must be ruled |
| | | | If angles stated: measure 3 angles and if in tolerance and no incorrect angles or percentages have been stated, allow the A2 |
| | | | If 3 or 4 angles not stated: measure all 4 angles and if all 4 in tolerance allow the A2 otherwise award A1 |
| | | | A1 FT for at least 2 out of their 4 angles in tolerance; may be unlabelled |
| | | | NB B1 M1 M0 A1 is possible |
| | | (0) | |
| | | (6) | |

| 19.* Both to £: 110 × 0.9(0) oe or 99 and 125 ÷ 1.25 oe or 100 OR € to £ and £ to \$: 110 × 0.9(0) oe or 99 and 99 ×1.25 oe or 123.75 OR \$ to £ and £ to €: 125 ÷ 1.25 oe or 100 and 100 ÷ 0.9(0) oe or 111.11 | M2 | Allow e.g. $1.25 \times 100 = 125$ for $125 \div 1.25$; Allow M2 for e.g. $110 \times 0.9(0)$ and $110 \times 0.9(0) \times 1.25$ or $125 \div 1.25$ and $(125 \div 1.25) \div 0.9(0)$ (may be in stages) M1 for $110 \times 0.9(0)$ oe or 99 or $125 \div 1.25$ oe or 100 si |
|--|-----|--|
| Germany indicated with (£)99 and (£)100 seen OR (£)99 and (\$)123.75 seen OR (£)100 and (€)111.11 seen | A1 | Allow (\$)123() OR (\$)123 or (\$)124 from correct working Allow (€)111() |
| | (3) | |

| 20.* | | | |
|---------|---|--------------|--|
| | Second and fifth statements indicated and no others | B2 | B1 for each if only two statements indicated OR for exactly three statements indicated of which two are correct |
| | | (2) | |
| 21.*(a) | $\frac{1}{3} \times \pi \times 15^2 \times 30 \text{ oe, si}$ | M1 | Allow e.g. 3.14 substituted for π ; may be in stages; |
| | $\frac{1}{3} \times \pi \times 225 \times 30$ oe, si | A1 | Allow e.g. 3.14 substituted for π ; may be in stages |
| | 2250π (cm ³) | A1 | FT 'their 225', M1 A0 A1 is possible; Must be a multiple of π ; do not ignore subsequent evaluation of e.g. 2250 \times 3.14 |
| 21. (b) | radius 3 cm or diameter 6 cm and height 6 cm si | B1 | Correct use of the scale; may be implied by correctly drawn plan and elevation; |
| | For the plan: draws a circle, radius 3cm and for the side elevation: draws an isosceles triangle with base 6 cm and height 6 cm | B3 | FT 'their stated radius and their stated height' OR if no statement or calculation for radius and height, FT 'their diameter = their height = their base' For B3, circle must be drawn with compasses and triangle must be ruled B2 FT for either an accurately drawn, correct plan or an accurately drawn, correct elevation FT 'their stated radius and their stated height' OR if no statement or calculation for radius and height, FT 'their diameter = their base' or 'their base = their height' or 'their diameter = their height' OR B2 FT for good sketches of both the correct plan and elevation or one sketch and one drawn accurately FT 'their stated radius and their stated height' OR if no statement or calculation for radius and height, FT 'their diameter = their height = their base' B1 for a circular plan with any radius or for a side elevation that is an isosceles triangle with any dimensions; allow good freehand for B1 but base of triangle must not be clearly curved If B1 B0 or B0 B0, award SC1 for an accurate plan and elevation drawn in incorrect positions |
| | | / 7 \ | |
| | | (7) | |

| 22.* (a) | | Plots accurate to within ½ a small square but mark intent |
|--|-------|--|
| Uniform scale used on vertical axis | B1 | Must allow plots up to 225 litres and start at zero |
| Line starting at (0, 225) | B1 | According to their scale |
| Single straight line with correct gradient si | B1 | e.g. single straight line passing through any two of (10, 175), (20, 125), (30, 75), (40, 25), (45,0) according to their scale |
| | | or line drawn using e.g. 50 litres = 10 minutes to plot and join points |
| Ruled, single straight line ending at (45, 0) | B1 | |
| 22. (b) (225 ÷ 10) × 6 or 135 OR (225 ÷ 10) × 4 or 90 OR (225 ÷ 10) × 4 ÷ 5 or (45 ÷ 10) × 4 oe | | Ignore units if stated Equivalent calculations for M1 e.g. (50% + 10% =)112.5 + 22.5 or |
| | | (50% - 10% =) 112.5 – 22.5 |
| 18 (minutes) | | if 90 or 135 found and using correct graph accept 17 – 19 mins |
| | | FT 'their single straight line' read at a volume = 135 providing that it has negative gradient; allow good freehand here |
| | | Accept 18 mins even if graph incorrect as can be done without it e.g. 90 ÷ 5 |
| | ····· | 18 (mins) without working implies M1 A1 |
| | (6) | |

| B1 | 23.*(a) | | |
|--|---|-----|---|
| 23. (b) 0.6 × 0.3 oe 0.18 oe A1 ignore attempts to convert to a different form; ignore embellishments such as unlikely, even if incorrect 23. (c) 0.4 × 0.1 oe 0.04 oe M1 A1 ignore attempts to convert to a different form; ignore embellishments such as unlikely, even if incorrect (5) 24.** 2(h) or 120 (min) × 6 × 8 oe (8 machines 3000 ÷ 2 ÷ 6 × 8 =) 2000 erasers per hour or better 26 (8 machines decorated as a final point of the position of th | | B1 | |
| 0.18 oe 0.18 oe 0.18 oe 0.18 oe A1 ignore attempts to convert to a different form; ignore embellishments such as unlikely, even if incorrect 23. (c) 0.4 × 0.1 oe 0.04 oe A1 ignore attempts to convert to a different form; ignore embellishments such as unlikely, even if incorrect (5) 24.* 2(h) or 120 (min) × 6 ↑ 3 ↑ 8 ○ 0 Operations may be done in any order and in stages For complete correct method e.g. $\frac{2}{3} \div \frac{4}{3}$ or $\frac{2}{3} \times \frac{3}{4}$ M1 for partial correct method using time and using any two correct operations and no wrong operations OR (8 machines 3000 ÷ 2 ÷ 6 × 8 =) 2000 erasers per hour or better Alternative method Complete method e.g. M2 M3 M4 A1 If units are given they must be correct M4 Correct step(s) to 1000 and correct step(s) to 8 or e.g. M3 M4 M5 M6 M6 M7 M8 M7 Correct step(s) to 1000 and correct step(s) to 8 or e.g. M8 M8 M9 M9 Correct step(s) to 1000 and correct step(s) to 8 or e.g. M9 M1 M1 M1 M2 M3 M6 M1 M7 M6 M6 M7 M8 M9 M9 M8 M9 M9 M9 M9 M9 M9 | | | |
| ignore embellishments such as unlikely, even if incorrect 23. (c) 0.4 × 0.1 oe 0.04 oe M1 A1 ignore attempts to convert to a different form; ignore embellishments such as unlikely, even if incorrect (5) Operations may be done in any order and in stages For complete correct method e.g. $\frac{2}{3} \div \frac{4}{3}$ or $\frac{2}{3} \times \frac{3}{4}$ A1 if or partial correct method using time and using any two correct operations and no wrong operations OR (8 machines 3000 ÷ 2 ÷ 6 × 8 =) 2000 erasers per hour or better A1 ignore attempts to convert to a different form; ignore embellishments such as unlikely, even if incorrect Operations may be done in any order and in stages For complete correct method e.g. $\frac{2}{3} \div \frac{4}{3}$ or $\frac{2}{3} \times \frac{3}{4}$ M1 for partial correct method using time and using any two correct operations and no wrong operations OR M1 for 3000 ÷ 2 ÷ 6 × 8 or 3000 ÷ 120 ÷ 6 × 8 or 3000 ÷ 120 ÷ 6 × 8 or If units are given they must be correct M2 Correct step(s) to 1000 and correct step(s) to 8 or e.g. M3 Correct step(s) to 1000 and correct step(s) to 8 or e.g. M4 Correct step(s) to 1000 and correct step(s) to 8 or e.g. M5 (incur) or 30 (mins) M6 3000 2 1 500 2 M1 for finding 1 machine makes 250 erasers per hour or (time needed is to make)1000 ÷ 8 = 125 (erasers per machine) or any one correct step e.g. M6 3000 2 1 500 2 | l ' ' | M1 | |
| M1 | 0.18 oe | A1 | ignore embellishments such as unlikely, even if |
| ignore embellishments such as unlikely, even if incorrect (5) 24.* 2(h) or 120 (min) × 6 At a stages At a stages M2 For complete correct method e.g. $\frac{2}{3} \div \frac{4}{3}$ or $\frac{2}{3} \times \frac{3}{4}$ M1 for partial correct method using time and using any two correct operations and no wrong operations OR (8 machines 3000 ÷ 2 ÷ 6 × 8 =) 2000 erasers per hour or better Atternative method Complete method e.g. Atternative method Complete method e.g. Machines Frasers Hours 6 3000 2 2 1000 2 8 1000 ½ Or Machines Frasers Hours 6 3000 2 1 250 1 and (time needed is to make) 1000 ÷ 8 = 125 (erasers per machine) oe M1 for finding 1 machine makes 250 erasers per hour or (time needed is to make) 1000 ÷ 8 = 125 (erasers per machine) or any one correct step e.g. Machines Frasers Hours 6 3000 2 1 500 2 M1 for finding 1 machine makes 250 erasers per hour or (time needed is to make) 1000 ÷ 8 = 125 (erasers per machine) or any one correct step e.g. Machines Frasers Hours 6 3000 2 1 500 2 M1 for finding 1 machine makes 250 erasers per hour or (time needed is to make) 1000 ÷ 8 = 125 (erasers per machine) or any one correct step e.g. Machines Frasers Hours 6 3000 2 1 500 2 M1 for finding 1 machine makes 250 erasers per hour or (time needed is to make) 1000 ÷ 8 = 125 (erasers per machine) or any one correct step e.g. Machines Frasers Hours 6 3000 2 1 500 2 | | M1 | |
| 24.* 2(h) or 120 (min) $ \times 6 $ $ \times 6 $ $ \times 8 $ oe OR (8 machines $3000 \div 2 \div 6 \times 8 =)$ $ 2000 \text{ erasers per hour or better} $ $ \times 8 $ $ \times 8 $ $ \times 8 $ OR (8 machines $3000 \div 2 \div 6 \times 8 =)$ $ 2000 \text{ erasers per hour or better} $ $ \times 8 $ $ \times 8 $ $ \times 8 $ OR (8 machines $3000 \div 2 \div 6 \times 8 =)$ $ 2000 \text{ erasers per hour or better} $ $ \times 8 $ $ \times 8 $ OR M1 for partial correct method using time and using any two correct operations and no wrong operations OR M1 for $3000 \div 2 \div 6 \times 8 \text{ or } 3000 \div 120 \div 6 \times 8 \text{ or } 3000 \div 120 \div 6 \times 8 \text{ oe} $ If units are given they must be correct $ \times 8 $ $ \times 8 $ $ \times 8 $ $ \times 9 $ | 0.04 oe | A1 | ignore embellishments such as unlikely, even if |
| Operations may be done in any order and in stages M2 For complete correct method e.g. $\frac{2}{3} \div \frac{4}{3}$ or $\frac{2}{3} \times \frac{3}{4}$ M3 For complete correct method e.g. $\frac{2}{3} \div \frac{4}{3}$ or $\frac{2}{3} \times \frac{3}{4}$ M4 M5 M6 M7 M8 M8 M8 M8 M8 M8 M8 M9 M8 M9 M8 M9 M8 M9 M8 M1 for partial correct method using time and using any two correct operations and no wrong operations OR M1 for $300 \div 2 \div 6 \times 8$ or $3000 \div 120 \div 6 \times 8$ oe M8 M8 M8 M8 M9 M9 M9 M9 M9 M9 | | (5) | |
| For complete correct method e.g. $\frac{1}{3} \div \frac{1}{3}$ or $\frac{1}{3} \times \frac{1}{4}$ $\div 8$ oe OR (8 machines $3000 \div 2 \div 6 \times 8 =$) 2000 erasers per hour or better 2000 erasers per hour or 2000 erasers per hours 2000 erasers | | | · · · · · · · · · · · · · · · · · · · |
| $\begin{array}{c} + 8 \\ \text{oe} \\ \text{OR} & \text{(8 machines } 3000 \div 2 \div 6 \times 8 =) \\ 2000 \text{ erasers per hour or better} \\ \text{OR} & \text{(8 machines } 3000 \div 2 \div 6 \times 8 =) \\ 2000 \text{ erasers per hour or better} \\ \text{OR} & \text{(1 for 3000 } \div 2 \div 6 \times 8 \text{ or } \\ 3000 \div 120 \div 6 \times 8 \text{ oe} \\ \text{OR} & \text{M1 for } 3000 \div 2 \div 6 \times 8 \text{ or } \\ 3000 \div 120 \div 6 \times 8 \text{ oe} \\ \text{A1} & \text{If units are given they must be correct} \\ \text{A1} & \text{If units are given they must be correct} \\ \text{A2} & \text{(2 correct step(s) to } 1000 \text{ and correct step(s) to } 8 \\ \text{Or e.g.} \\ \text{A3} & \text{(3 o)} & (2 in a single of a single o$ | - | M2 | For complete correct method e.g. $\frac{2}{3} \div \frac{4}{3}$ or $\frac{2}{3} \times \frac{3}{4}$ |
| OR (8 machines $3000 \div 2 \div 6 \times 8 =$) 2000 erasers per hour or better We (hour) or 30 (mins) Alternative method Complete method e.g. Machines Erasers Hours 6 3000 2 2 1000 2 8 1000 2 8 1000 2 8 1000 2 8 1000 2 8 1000 3 8 1000 3 Machines Erasers Hours 6 3000 2 (erasers per machine) oe M1 for finding 1 machine makes 250 erasers per hour or (time needed is to make) 1000 $\div 8 = 125$ (erasers per machine) or any one correct step e.g. Machines Erasers Hours 6 3000 2 1 500 2 1 1000 | ÷ 3 | | |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | oe | | using any two correct operations and no wrong |
| Alternative methodComplete method e.g.M2Correct step(s) to 1000 and correct step(s) to 8 or e.g. $\frac{Machines}{6}$ $\frac{Erasers}{3000}$ $\frac{Machines}{2}$ $\frac{Erasers}{6}$ $\frac{Hours}{3000}$ $\frac{Machines}{6}$ $\frac{Erasers}{3000}$ $\frac{Hours}{2}$ $\frac{6}{3000}$ $\frac{2}{3000}$ $\frac{1}{2}$ $\frac{1}{250}$ $\frac{1}{2}$ $\frac{1}{250}$ $\frac{1}{2}$ $\frac{1}{250}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{250}$ $\frac{1}{2}$ < | , | | |
| Complete method e.g. Machines Erasers Hours | 1/2 (hour) or 30 (mins) | A1 | If units are given they must be correct |
| ½ (hour) or 30 (mins) A1 If units are given they must be correct | Complete method e.g. Machines Erasers Hours 6 3000 2 2 1000 2 8 1000 ½ or Machines Erasers Hours 6 3000 2 8 4000 2 | M2 | or e.g. |
| <u> </u> | 1/2 (hour) or 30 (mins) | | If units are given they must be served |
| (3) | /2 (Hour) or 30 (Hillis) | | ii units are given triey must be correct |

| 25.*(a) $8x^2 - 4x + 10x - 5$ | B2 | B1 for any two terms correct; $nx^2 + 6x + m$ implies two terms correct if not from wrong working |
|-------------------------------|-----|--|
| $8x^2 + 6x - 5$ | B1 | Implies previous B2; FT for equivalent level of difficulty, providing a quadratic expression with 4 terms to consider and like terms in <i>x</i> to collect with opposite signs mark final answer except ignore '=0' |
| 25. (b)(i) $(x-3)(x-7)$ oe | B2 | If not B2, award B1 for $(x 3)(x 7)$ or for $x(x-7)-3(x-7)$ oe; ignore '= 0' If no marks, award SC1 for factors $x-3$ and $x-7$ stated but not as a product |
| 25. (b)(ii) $x = 3, x = 7$ | B1 | STRICT FT from 'their $(x \dots a)(x \dots b)$ ' where a and b are constants; |
| | (6) | |

| 26.*(a) (Proportion of marked moths in sample is) $\frac{9}{12} \left(= \frac{3}{4} \right) \text{ oe, si or}$ (Proportion of 2nd sample marked is) $\frac{9}{30} \left(= \frac{3}{10} \right) \text{ oe, si}$ | | Allow for e.g. '9 out of 12 (marked)' or '9 (marked) out of 30' allow for sight of e.g. $\frac{12\times30}{9}$ (= 40) |
|---|-----|--|
| Correct completion e.g. $\frac{9}{30} = \frac{12}{40} \text{ (so 40 moths)}$ $OR \frac{9}{12} = \frac{30}{40} \text{ (so 40 moths)}$ OR $75\% \text{ (of population) is 30 (moths)}$ so 100% (of population) is 30 + 10 = 40 (moths) oe | B1 | Implies the first B1; Allow for • showing '12 out of 40' and '9 out of 30' are both '3 out of 10' or • $\frac{9}{12} = \frac{30}{x}$ and $9x = 360$, $x = 40$ oe NB $\frac{12 \times 30}{9} = \frac{360}{9} = 40$ is B2 |
| Valid comment based on sample or population size e.g. 'It may not be very reliable as he only captured 12 moths in his first sample.' or 'Some of the moths may have been eaten so the results may not be accurate.' | E1 | Allow e.g. 'Not reliable because the population would be bigger at different times of the year.' Allow comments which refer to the experiment needing to be repeated E1 for e.g. 'Somewhat reliable because it was done once and it could be different if repeated again' or 'Not reliable as he needs to do it more often.' Must not contain contradictions/errors but may contain irrelevant statements E0 for e.g. 'Not very reliable as there could have been more moths.' or 'Unlikely (to be reliable) because it has only been tested twice' or 'Not reliable because he could keep catching the same moths over and over.' |
| | (3) | |