



GCSE MARKING SCHEME

AUTUMN 2024

**GCSE
MATHEMATICS – NUMERACY
UNIT 2 – INTERMEDIATE TIER
3310U40-1**

About this marking scheme

The purpose of this marking scheme is to provide teachers, learners, and other interested parties, with an understanding of the assessment criteria used to assess this specific assessment.

This marking scheme reflects the criteria by which this assessment was marked in a live series and was finalised following detailed discussion at an examiners' conference. A team of qualified examiners were trained specifically in the application of this marking scheme. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners. It may not be possible, or appropriate, to capture every variation that a candidate may present in their responses within this marking scheme. However, during the training conference, examiners were guided in using their professional judgement to credit alternative valid responses as instructed by the document, and through reviewing exemplar responses.

Without the benefit of participation in the examiners' conference, teachers, learners and other users, may have different views on certain matters of detail or interpretation. Therefore, it is strongly recommended that this marking scheme is used alongside other guidance, such as published exemplar materials or Guidance for Teaching. This marking scheme is final and will not be changed, unless in the event that a clear error is identified, as it reflects the criteria used to assess candidate responses during the live series.

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[illegible]

$2(b) \frac{1}{2} \times (1 - \frac{1}{6})$ or $\frac{1}{2} \times \frac{5}{6}$ or equivalent $\frac{5}{12}$ or equivalent fraction	M1 A1	Allow $0.5 \times 0.833(\dots)$ Do not accept 0.5×0.83 An answer of $\frac{2.5}{6}$ is awarded M1 A0 If no marks, award SC1 for an answer of $(\frac{1}{2} \times \frac{1}{6} =) \frac{1}{12}$
<u>2(b) Alternative method</u> Correctly evaluated $\frac{1}{2} \times \frac{5}{6} \times \text{an amount}$ $\frac{5}{12}$ or equivalent	B1 B1	May be seen in stages Must be an exact amount calculated, not rounded or truncated, e.g. £60 as 'their amount' to give £25 An answer of $\frac{2.5}{6}$ is awarded B1 B0
3(a) 20 (students)	B1	
3(b) 4 (students)	B1	
3(c) 91 (students)	B1	Answer space takes precedence
3(d) 21 (students)	B1	Answer space takes precedence
3(e) Drums AND 23 (students)	B1	Answer space takes precedence
4(a) (Volume of the small box) $10 \times 10 \times 10$ or (Volume of the large box) $2 \times 10 \times 10 \times 10$ (Volume of the small box) $1000 \text{ (cm}^3\text{)}$ or (Volume of the large box) $2000 \text{ (cm}^3\text{)}$ Height of large box $\times 12.5 \times 12.5 = 2 \times 1000$ or Height of large box $\times 12.5 \times 12.5 = 2000$ (Height of large box $=) \frac{2 \times 1000}{12.5 \times 12.5}$ or equivalent (2000 $\div$ 156.25 $=$) 12.8 (cm)	M1 A1 m1 M1 A1	May be implied in further working FT incorrect evaluation of volume Allow for evidence of trial to find the height such that a <u>clear</u> attempt to get an answer of approximately 2000 provided <u>2000 seen</u> , e.g. volume 2000 (cm ³) followed by $13 \times 12.5 \times 12.5 = 2031.25$. Not for sight of $12.5 \times 12.5 \times 12.5 (= 1953.125)$ FT from previous M1 m0, for omitted 2 or incorrect interpretation of 'twice' provided appropriate rearrangement is in the form $\frac{10 \times 10 \times 10}{12.5 \times 12.5}$ or $\frac{10 \times 10 \times 10}{2 \times 12.5 \times 12.5}$ or equivalent i.e. must include $(10 \times 10 \times 10) \div (12.5 \times 12.5)$ with incorrect interpretation of '2' or omitted '2' CAO Allow final M1 A1 for an embedded correct answer if not contradicted, e.g. $12.5 \times 12.5 \times 12.8 = 2000$
4(b) (Surface area of the box) $6 \times 10 \times 10$ (= 600) (Cost) $6 \times 10 \times 10 \div 240$ (£) 2.5(0)	B1 M1 A1	 FT 'their <u>surface area</u> ' provided it is a multiple of 100 and $300 \leq \text{'their surface area'} \leq 600$, i.e. only FT 300, 400 and 500 CAO. Answer space takes precedence

6. (Area of floor) $\frac{1}{2} \times 4.3 \times 2.7$ $5.8 \text{ (m}^2\text{)} \text{ or } 5.805 \text{ (m}^2\text{)} \text{ or } 5.81 \text{ (m}^2\text{)}$ (3 tins covers) $3 \times 1.6 \text{ (= 4.8)}$ OR (Number of tins of varnish) $5.805 \div 1.6$ $(= 3.628\dots)$ OR (Area per tin if only 3 tins) $5.805 \div 3 \text{ (= 1.935)}$ States or unambiguously implies 'No' AND a suitable correctly evaluated calculation, e.g. $(3 \times 1.6 =) 4.8 \text{ (m}^2\text{)}$ $(5.805 \div 1.6 =) 3.6(28\dots) \text{ or } 4 \text{ (tins)}$ $(5.805 \div 3 =) 1.935 \text{ (m}^2\text{)}$	M1 A1 M1 A1	Accept 6 (m²) provided correct working seen Use of information given in the question OR FT 'their derived area of floor', including if not dimensionally correct, e.g. allow FT if 'their derived area' = $2.7 + 4.3 = 7$ or $4.3 \times 2.7 = 11.61$ or $\sqrt{4.3^2 + 2.7^2} = 5.077\dots$ or $\sqrt{4.3^2 + 2.7^2} + 2.7 + 4.3 = 12.077\dots$ FT 'their derived area of floor', provided their area calculation involves 4.3×2.7 and is <u>dimensionally correct</u> Ignore additional spurious statements or calculations provided a correct comparison with 'their number of tins' with 3, or 'their area' with 4.8(m²) is given
7(a) (Electricity cost is) $654 \times (\text{£})0.30$ $(\text{£})196.2(0) \text{ or } 19620(\text{p})$ (Cost of electricity and standing charge is $\text{£}196.20 + 54 =)$ $(\text{£}) 250.2(0)$ (Total bill including VAT) $1.05 \times 250.2(0)$ or $250.2(0) + 12.51$ $(\text{£})262.71$	M1 A1 B1 M1 A1	<u>Incorrect unit of money is penalised -1 once only on the first occurrence, by withholding an A or B mark</u> Accept $654 \times 30(\text{p})$ If units are given they must be correct Accept $\text{£}196.20\text{p}$ FT provided 654 used in a calculation for 'their cost of electricity' Do not accept if embedded with an incorrect interpretation of the standing charge, e.g. $196.20 + 3 \times 54 = (\text{£})358.20$ is B0 If previous M0 A0 B0 for $(654 \times (\text{£})0.30 \times 3 =) \text{£}588.60$ AND $(588.60 + 54 \times 3 = 588.60 + 162 =) \text{£}750.60$, award SC1 for this consistent misunderstanding and then FT FT from 'their derived total of electricity' + 'their standing charge', accept rounding or truncation to a penny Allow M1 A0 for $1.05 \times$ 'their total rounded or truncated to a whole pound' If M0 A0 for inclusive of VAT cost, allow SC1 for an answer of $(\text{£})262.70$, provided not from incorrect working (allow from $250.20 + 12.50$) If final B0 M0 A0, award SC1 for the correct evaluation of $1.05 \times$ 'their derived cost of electricity' having not considered and omitted the standing charge, or previously subtracted the standing charge from 'their cost of electricity'
7(b) $(2.31 \div 7) \div 0.30$ or $(2.31 \div 0.30) \div 7$ or $(231 \div 7) \div 30$ or $(231 \div 30) \div 7$ or equivalent 1.1 (kWh)	M2 A1	Allow if brackets are implied in further working May be shown in stages M1 for any of the following: $2.31 \div 0.30 \text{ (= 7.7)}$ $2.31 \div 7 \text{ (= 0.33)}$ $(231 \div 7) \div 30 \text{ (= 110)}$ $(2.31 \div 7) \div 30 \text{ (= 0.011)}$ $(231 \div 0.30) \div 7 \text{ (= 110)}$ $(2.31 \div 30) \div 7 \text{ (= 0.011)}$ CAO. Ignore incorrect units

7(c) (Height freezer door) $2 \times 1800 \div 5$ or $\frac{2}{5} \times 1800$ or 0.4×1800 or equivalent 720 (mm) ((Diagonal of freezer door)² =) $600^2 + 720^2$ Diagonal² = 878 400 or (Diagonal =) $\sqrt{878\,400}$ (Diagonal =) 937(.22... mm)	M1 A1 M1 A1 A1	Or alternative full method FT 'their height of freezer door' including 1080 or 1800 Accept working in m or cm for possible M1, A1 Final answer must be given in mm FT from M1 for the correctly evaluated square root of 'their 878 400' provided 'their answer' > 'their 720' for possible A1 If final M0 A0 A0 awarded as a different length, not 'their 720', is used to calculate the diagonal, award SC1 for a correct statement of Pythagoras' Theorem, and SC1 for a correct evaluation of 'their diagonal'
8(a)(i) (Calories in cake(s)) $84 \times 600 \div 100$ ($\div 4$) OR (Mass per cake) $84 \div 4$ (= 21)g <u>AND</u> (Calories per 1g of cake) $600 \div 100$ (= 6 calories) (Calories in 1 cake 21×6 =) 126 (calories) (% of required calories) $\frac{126}{2400} (\times 100)$ or $0.0525 (\times 100)$ or $\frac{5.25}{100}$ 5.25(%)	M1 A2 M1 A1	A1 for any one of the following: (calories in 4 cakes $84 \times 6 =$) 504 (calories) - an answer from premature approximation of $100 \div 21$ in the range 4.76 to 4.8 giving an answer in the range 125 to 126.050..(calories) FT 'their derived calories' provided - calories information was used in 'their calculation of calories, <u>and</u> 'their derived calories' $\neq 600$ e.g. 600 calories (in 100 g), or 6 calories (in 1 g), or similar used in a calculation to derive a number of calories ISW further rounding or truncation Allow 5(%), 5.2(%) or 5.3(%) from correct working If no marks, award SC1 for $(600 \times 84 \div 4 =)$ 12 600
<u>8(a)(i) Alternative method only when working is seen as a single calculation</u> $\frac{600}{2400} \times \frac{84}{100} \times \frac{1}{4} (\times 100)$ or equivalent Two correct stages of simplifying or calculation 5.25 (%)	M3 A1 A1	M2 for $\frac{600}{2400} \times \frac{84}{100} (\times 100)$ or equivalent FT from M2 FT from M2 for an answer of 21(%))
8(a)(ii) $84 \times 515 \div (1360 + 2725 + 515 + 4)$ or $84 \times 515 \div 4604$ 9.4 (g)	M1 A2	A1 for 9.3(96... g) not from premature approximation or $\frac{10815}{1151}$ or 9.40 (g)
8(b)(i) $143 \div 2.2$ 65 (kg)	M1 A1	Answer space takes precedence Accept use of $143 \div 2.205 = 64.85...$ (kg) as a more accurate conversion

8(b)(ii) Any one of the following complete methods for the number of minutes to burn off energy in 1 banana: • $92 \div (690 \div 60)$ • $60 \times (92 \div 690)$ • $60 \div (690 \div 92)$ 8 (minutes)	M2 May be seen in stages M1 for any one of the following: • $690 \div 60$ (= 11.5) • $92 \div 690$ ($= \frac{2}{15} = 0.1333\dots$) • $690 \div 92$ (= 7.5) A1 CAO. Answer space takes precedence
8(b)(iii) $9 \times 38 \div 60$ 5.7 (km)	M2 M1 for sight of any one of the following: • 9×38 (= 342) • $38 \div 60$ (= 0.6333....) • $9 \div 60$ (= 0.15) A1 CAO, allow 5700m Answer space takes precedence Do not accept 5700 (km) in the answer space
9(a) (Length of the flagpole below the rod =) $3.8 \times \sin 55^\circ$ or $3.8 \times \cos (90^\circ - 55^\circ)$ or $380 \times \sin 55^\circ$ or $380 \times \cos (90^\circ - 55^\circ)$ 3.11(2...m) or 311(.2.. cm) (Total length $1.5 + 3.11 =$) 4.61 (m) or 461 (cm)	M2 Or alternative full method M1 for correct working without isolating 'length' $\sin 55^\circ = \frac{\text{length}}{3.8}$ or $\cos (90^\circ - 55^\circ) = \frac{\text{length}}{3.8}$ or $\sin 55^\circ = \frac{\text{length}}{380}$ or $\cos (90^\circ - 55^\circ) = \frac{\text{length}}{380}$ A1 Allow 3.1 (m) or 310 (cm) A1 Must be to the nearest cm FT provided at least M1 previously awarded, i.e. for $1.5 + \text{'their 3(.)11'}$ correctly evaluated, to nearest cm, and 'their 3.11' is to at least 2 decimal places If units are given they must be correct
9(b)(i) $120 \times 64 \div 80$ or 64×1.5 or 120×0.8 or $120 \div 1.25$ or $64 \div \frac{2}{3}$ or equivalent 96 (cm)	M1 A1 Answer space takes precedence
9(b)(ii) $75 \times 80 \div 120$ or $75 \div 1.5$ or $75 \times \frac{2}{3}$ or $80 \div 1.6$ or 80×0.625 or $64 \times 75 \div 96$ or equivalent 50 (cm)	M1 FT from (b)(i) $64 \times 75 \div \text{'their 96'}$ or equivalent A1 Answer space takes precedence
10(a)(i) States 80 (and) 100 (seconds) AND indicates 'Yes'	B1 Allow written as 100 and 80 Answer space takes precedence
10(a)(ii)I. $(80 - 75 =)$ 5 (seconds)	B1 Not from incorrect working Answer space takes precedence
10(a)(ii)II. Answer in the inclusive range 12 to 14 (seconds)	B2 Allow in this range only provided it not from incorrect working Answer space takes precedence B1 for sight of $92 - 60 (-20)$ to $94 - 60 (-20)$ or $32 (-20)$ to $34 (-20)$

10(b) 96 (seconds)	B3	Answer space takes precedence B2 for sight of or indication of 64 (squirrels), B1 any one of the following: - for sight of or indication of 16 (squirrels) (use of 16 squirrels) answer of 52 (seconds) B0 for 64 seconds from incorrect working, 20% of 120 = 24, with time 64 seconds B0 for 96 seconds from incorrect working, 80% of 120 = 96, with time 96 seconds
10(c) $(24 \div 21\,500) \times 1\,000\,000$ (squirrels per km ²)	M2	Accept using estimation: $(24 \div 20\,000) \times 1\,000\,000$ M1 for any one of the following, including if embedded: $24 \div 21\,500$ (= 0.001116... squirrels per m²) (estimate) $24 \div 20\,000$ (= 0.0012 squirrels per m²) $1\,000\,000 \div 21\,500$ (= 46.5....) (estimate) $1\,000\,000 \div 20\,000$ (= 50)
1116(.27...) (squirrels per km ²) AND Conclusion indicated or unambiguously implied 'Oak'	A1	Accept 1200 from estimating, i.e. $(24 \div 20\,000) \times 1\,000\,000 = 1200$ (squirrels per km²) If no marks, award SC1 for appropriate sight of a calculation of <u>$24 \div \text{'a number with only non-zero digits 215'}$</u>, provided not embedded in further working apart from multiplication or division by powers of 10
10(c) <i>Alternative method</i> (If oak , number of squirrels likely in Maesgwyn Forest) $21\,500 \times 1200 \div 1\,000\,000$	M2	Allow M2 for (If chestnut) $21\,500 \times 100 \div 1\,000\,000$ (= 2.15) or (if pine) $21\,500 \times 45 \div 1\,000\,000$ (= 0.9675) M1 for any one of the following, including if embedded: (if oak) $21\,500 \times 1200$ (= 25 800 000) (If chestnut) $21\,500 \times 100$ (= 2 150 000) (if pine) $21\,500 \times 45$ (= 967 500) $21\,500 \div 1\,000\,000$ (= 0.0215) $20\,000 \div 1\,000\,000$ (= 0.02)
25.8 (squirrels) AND 'Oak' indicated as conclusion	A1	Allow from correct working either 2.15 (squirrels for Chestnut so must be) Oak, or 0.9675 or 1 (squirrels for Pine so must be) Oak If no marks, award SC1 for appropriate sight of any 1 of the following calculations: <u>$\text{'a number with only non-zero digits 215'} \times 1200$</u> <u>$\text{'a number with only non-zero digits 215'} \times 45$</u> provided not embedded in further working apart from multiplication or division by powers of 10