



GCSE MARKING SCHEME

AUTUMN 2024

**GCSE
MATHEMATICS – NUMERACY
UNIT 1 – HIGHER TIER
3310U50-1**

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.

<p>2. <u>Question 1</u> At least 3 groups without gaps or overlaps that cover a minimum inclusive range of 1 (day) to 20 (days)</p>	B1	<p>Listings must all be groups, with the exception of the initial inclusion of '0', provided at least 3 further groups are given</p> <p>Allow, e.g. 'Less than 8 (days), 8 to 15 (days), more than 15 (days)' '0, 1 to 10 days, 11 to 15 days, 16+ days'</p> <p>Do not accept, e.g. '1 < days < 7, 8 < days < 14, 15 < days < 21, ...' (misuse of inequalities) '0, 1 to 10 days, 11 to 21 days' (0 is not a group, so only 2 groups)</p>
<p>2. <u>Question 2</u> At least 3 appropriate criteria in any order, e.g. 'Great, reasonable, not good', 'Scale of 0 to 10, with 10 being very happy', 'Very unhappy, happy, very happy', 'Yes, no, sometimes'</p>	B1	<p>Accept use of smiley, blank and sad faces</p> <p>Allow, e.g. 'Yes, no, not sure', 'Yes, no, no answer'</p> <p>Do not accept, e.g. 'Scale of 0 to 10' without stating which end of the scale is unhappy or happy, 'Yes, no, own answer', as 'own answer' is not a group</p>
<p>3. Appropriate sight of (30 000 – 10 000 =) 20 000 (dollars) or (36 000 – 30 000 =) 6000 (dollars)</p> <p>(Tax at 10%) $0.10 \times (30\,000 - 10\,000)$ or $0.10 \times 20\,000$ or equivalent 2000 (dollars)</p> <p>(Tax at 25%) 0.25×6000 or or $0.25 \times (36\,000 - 30\,000)$ or equivalent 1500 (dollars)</p> <p>(Total tax due) 3500 (dollars)</p>	<p>B1</p> <p>M1</p> <p>A1</p> <p>M1</p> <p>A1</p> <p>B1</p>	<p>Ignore £ or other currency for dollars May be implied in further working</p> <p>FT use of 'their (30 000 – 10 000)' from an error in subtraction</p> <p>CAO</p> <p>FT use of 'their (36 000 – 30 000)' from an error in subtraction</p> <p>CAO</p> <p>ISW FT 'their 2000' + 'their 1500' provided both M1 marks previously awarded</p>

<p>5(a) $0.03 \times 4000 + 4000$ or 1.03×4000 (= £4120) or equivalent</p> <p>$0.03 \times 4120 + 4120$ or 1.03×4120 or equivalent</p> <p>(£)4243.6(0)</p>	<p>M1</p> <p>M1</p> <p>A1</p>	<p>Allow for sight of one of the following:</p> <ul style="list-style-type: none"> • 4120 (irrespective of labelling) • 4240 (simple interest) <p>FT 'their 4120' (the mark is for the method) (= £123.6(0) + £4120)</p> <p>CAO. Answer space takes precedence if completed, otherwise mark final answer for the amount</p> <p>If no marks, award SC1 for (£)3763.6(0) (from depreciation)</p>
<p>5(a) <u>Alternative method</u></p> <p style="padding-left: 40px;"><i>Sight of $1.03^2 \times 4000$</i></p> <p style="padding-left: 40px;">1.0609×4000</p> <p>(£)4243.6(0)</p>	<p>M1</p> <p>A1</p> <p>A1</p>	<p>CAO. Answer space takes precedence if completed, otherwise mark final answer for the amount</p> <p>If no marks, award SC1 for (£)3763.6(0) (from depreciation)</p>
<p>5(b)(i) $100 \times 42 \div (100 + 40)$ or $42 \div 1.4$ or equivalent</p> <p>(£) 30</p>	<p>M1</p> <p>A1</p>	<p>CAO. Answer space takes precedence</p> <p>Accept a correct answer from trial and improvement</p>
<p>5(b)(ii) (Volume of gold = mass \div density =)</p> <p style="padding-left: 40px;">$6 \times 10^{-3} \times 1000 \div 20$</p> <p style="padding-left: 40px;">or $6 \div 20$</p> <p style="padding-left: 40px;">or $6 \times 10^{-3} \div (20 \div 1000)$</p> <p style="padding-left: 40px;">or $6 \times 10^{-3} \div 0.02$</p> <p style="padding-left: 80px;">or equivalent</p> <p>0.3 (cm³) or $\frac{3}{10}$ (cm³)</p>	<p>M2</p> <p>A1</p>	<p>Must be dimensionally correct</p> <p>M1 for any one of the following:</p> <ul style="list-style-type: none"> • sight of $6 \times 10^{-3} \times 1000$ (= 6 g) • sight of $20 \div 1000$ (= 0.02 kg/cm³) • method with incorrect place value, 'their mass' \div 'their density' provided that <ul style="list-style-type: none"> • the only non-zero digit in 'their mass' = 6 and • the only non-zero digit in 'their density' = 2 <p>e.g. $6 \times 10^{-3} \div 20$, $6 \times 10^{-3} \div 0.2$, $600 \div 20$, $6000 \div 20$</p> <p>CAO, allowing 3×10^{-1} (cm³)</p>
<p>6(a) 76 (g)</p>	<p>B1</p>	<p>Answer space takes precedence</p>
<p>6(b) $3 \times 400 \times 25 \div 100$ or $\frac{3}{4} \times 400$ or equivalent</p> <p>300 (little gulls)</p>	<p>M1</p> <p>A1</p>	<p>If no marks, award SC1 for ($\frac{1}{4} \times 400 =$) 100 (gulls)</p>
<p>6(c) 25(%)</p>	<p>B1</p>	<p>Answer space takes precedence</p>
<p>6(d)(i) Slender(-billed gulls)</p>	<p>B1</p>	
<p>6(d)(ii) Lower quartile</p>	<p>B1</p>	<p><u>Strictly depends on B1 previously awarded in (d)(i)</u></p>

7(a) 2.425 m	B1	
<p>7(b) Sight of 2.595 (m) or equivalent in cm or mm</p> <p>4 × 2.595 or 4 × 2.59 + 4 × 0.005 (= 10.36 + 0.02) or equivalent</p> <p style="text-align: right;">10.38(0 m)</p>	<p>B1</p> <p>M1</p> <p>A1</p>	<p>Award B1 for sight of 4 × 0.005 in an appropriate calculation Allow 0.004999(....) for 0.005, must clearly be a recurring 9 digit</p> <p>Or equivalent in cm or mm If B0, FT provided unambiguously chosen: FT 2.59 < 'their 2.595' ≤ 2.6</p> <p>CAO, must be given in metres</p>
<p>7(c)</p> <p>Complete method the calculate the percentage increase</p> <ul style="list-style-type: none"> • $\frac{1.2 \times 10^8 - 2 \times 10^7}{2 \times 10^7} (\times 100)$ • 5 (× 100) • $\frac{1.2 \times 10^8}{2 \times 10^7} (\times 100) - 1(\times 100)$ • 6 (× 100) – 1(× 100) <p style="text-align: right;">500 (%)</p>	<p>M2</p> <p>A1</p>	<p><u>Allow place value errors in writing given standard form numbers in full for M2 and M1 only</u></p> <p>M1 for any one of the following calculations or evaluations:</p> <ul style="list-style-type: none"> • $1.2 \times 10^8 - 2 \times 10^7$ (= 1 × 10⁸ = 100 000 000) • $\frac{1.2 \times 10^8}{2 \times 10^7}$ (= 0.6 × 10(× 100) or 6(× 100) or 600(%)) <p>CAO Answer space completing the statement takes precedence Accept equivalents 0.5 × 10³ or 5 × 10² Accept an unsupported correct answer or a correct answer from reverse calculations</p>

<p>8(a)(i) (Total number of 16-year-old girls =) $0.1 \times 10 + 0.4 \times 5 + 1 \times 5 + 0.8 \times 5 + 0.4 \times 5 + 1.2 \times 5 + 0.4 \times 5 + 0.2 \times 15$</p> <p>1 (+) 2 (+) 5 (+) 4 (+) 2 (+) 6 (+) 2 (+) 3 = 25 or equivalent</p>	<p>M2</p> <p>A1</p>	<p>Allow M2 for sight of all correct products M1 for the sight of any 3 different correct areas Possibly seen on the histogram</p> <p>Needs to be convincing The + signs can be implied by e.g. total = 25</p>
<p>8(a)(ii) (Number of 16-year-old girls > 162.5 =) $((4 \div 2) + 2 + 6 + 2 + 3) = 15$</p> <p>(Percentage > 162.5 cm =) $\frac{15}{25} (\times 100)$ or equivalent</p> <p>= 60 (%)</p>	<p>B1</p> <p>M1</p> <p>A1</p>	<p>FT 'their 4' $\div 2$ + 'their 2 + 6 + 2 + 3' for B1 and M1 provided the total is < 25 and the values are integers</p> <p>FT 'their 4' $\div 2$ + 'their 2 + 6 + 2 + 3' ± 1 or the result of an omission of 1 value from their sum</p> <p>CAO</p> <p>If no marks awarded, SC1 for an answer of 40(%) from $10/25 (\times 100)$</p>
<p><i>8(a)(ii) Alternative method:</i></p> <p>(Number of 16-year-old girls < 162.5 =) $(1 + 2 + 5 + (4 \div 2)) = 10$</p> <p>(Percentage < 162.5 cm =) $\frac{10}{25} (\times 100)$ or equivalent</p> <p>$(100 - 40) = 60 (\%)$</p>	<p>B1</p> <p>M1</p> <p>A1</p>	<p><i>If the candidate clearly attempts to calculate the % < 162.5 and then subtracts this from 100%</i></p> <p>FT 'their 1 + 2 + 5' + 'their 4' $\div 2$ for B1 and M1 provided the total is < 25 and the values are integers</p> <p>FT 'their 1 + 2 + 5' + 'their 4' $\div 2 \pm 1$ or the result of an omission of 1 value from their sum</p> <p>CAO</p>
<p>8(b)(i) Frequency densities of 0.2, 0.9, 0.8, 0.25 or equivalent</p>	<p>B2</p>	<p>FT 'their integer values' from (a)(i) Mark final answer B1 for any 2 or 3 correct FT $\frac{\text{'their 1' + 'their 2'}}{15}$, $\frac{\text{'their 5' + 'their 4'}}{10}$, $\frac{\text{'their 2' + 'their 6'}}{10}$ and $\frac{\text{'their 2' + 'their 3'}}{20}$ from (a)(i)</p>
<p>8(b)(ii) Correct bars drawn AND a suitable uniform vertical scale</p>	<p>B2</p>	<p>FT their frequency densities from (b)(i) B1 for at least 2 correct bars AND a suitable uniform vertical scale</p>

<p>9(a)(i) Sight of $\frac{150 \times 2 \times \pi \times 3}{360}$ OR $\frac{300 \times 2 \times \pi \times 3}{360}$ $(= 2.5\pi)$ $(= 5\pi)$</p> <p>(Length of wire =) $(2 \times) \frac{150 \times 2 \times \pi \times 3}{360} + (2 \times) 24 + 38$ or equivalent $= 5\pi + 86$ (cm)</p>	<p>B1</p> <p>M1</p> <p>A2</p>	<p>Or equivalents</p> <p>CAO Mark final answer A1 for sight of any one of the following:</p> <ul style="list-style-type: none"> • $\frac{1800\pi}{360} + 86$ or equivalent • $5\pi + \dots$ • $2.5\pi + \dots$ or $5\pi/2 + \dots$ provided an attempt has been made to add the 3 straight pieces
<p>9(a)(ii) e.g. $10x = 1.333\dots$, $100x = 13.333\dots$ AND an attempt to subtract both sides $= \frac{12}{90}$ or $\frac{132}{990}$ or $\frac{1332}{9990}$ or equivalent $= \frac{2}{15}$</p>	<p>M1</p> <p>A1</p> <p>A1</p>	<p>Allow A1 for e.g. 1.2/9</p> <p>FT from M1A0 provided of equivalent difficulty</p>
<p>9(a)(ii) <u>Alternative method:</u> $\frac{1}{10} + \frac{3}{90}$ or equivalent $= \frac{12}{90}$ or equivalent $= \frac{2}{15}$</p>	<p>M1</p> <p>A1</p> <p>A1</p>	<p>FT from M1A0 provided of equivalent difficulty</p>
<p>9(b) Statements required:</p> <ul style="list-style-type: none"> • Number the hangers from (0)1 to 80 • Consider successive 2-digit numbers • Do not use numbers outside the range e.g. Do not use 00 and 81 – 99, OR Use the numbers (0)1 to 80 • Ignore repeats <p>(Clothes hangers chosen =) 29, (0)7, (0)1, 30, 55, 79, 26, 30, 12</p>	<p>E2</p> <p>B1</p>	<p>All 4 needed for E2 E1 for any 2 or 3 correct statements</p> <p>Allow an equivalent numbering system e.g. (0)0 to 79 Their numbering system can be implied by the range of numbers they state they will choose from</p> <p>Allow the 2nd statement to be implied by their numbering of the hangers (from 01) AND their use of 2-digit numbers in their answer OR 2-digit numbers used in their answer with 07 and 01 seen</p> <p>Do not allow 'Use numbers less than 81' if they have numbered the hangers from 01 to 80, without stating that 00 will not be used</p> <p>ISW Answer space takes precedence</p>
<p>9(c) (Scale factor =) $\sqrt{1.44}$ or 1.2</p> <p>(Height of larger hanger =) $\sqrt{1.44} \times 9$ or 1.2×9 $= 10.8$ (cm)</p>	<p>B1</p> <p>M1</p> <p>A1</p>	<p>FT 'their $\sqrt{1.44}$' CAO</p>

<p>11(a)(i) (Area =) $\frac{1}{2} \times 1 \times (14 + 0 + 2(7 + 2 + 1 + 0.4))$ or equivalent = 17.4 (m)</p>	<p>M2 A1</p>	<p>M1 for at most 1 slip in substitution of values from the velocity axis OR M1 for 1 of the vertical readings omitted with all others correct FT from M1</p>
<p>11(a)(i) <i>Alternative method:</i> (Area =) $\frac{(14 + 7) \times 1}{2} + \frac{(7 + 2) \times 1}{2} + \frac{(2 + 1) \times 1}{2} + \frac{(1 + 0.4) \times 1}{2}$ $+ \frac{(0.4 + 0) \times 1}{2}$ [10.5 + 4.5 + 1.5 + 0.7 + 0.2] = 17.4 (m)</p>	<p>M2 A1</p>	<p>M1 for the sum of these 5 areas with at most one error (may be repeated) in the substitution of values from the velocity axis OR M1 for the sight of 5 correct areas with the intention to add them (possibly omitting one) FT from M1</p>
<p>11(a)(ii) Overestimate AND valid reason e.g. 'The trapeziums all extend above the curve', or 'The curve is below the area calculated', or 'The area of each trapezium is greater than the area under the curve', or 'The area of the 2nd trapezium is greater than the area under the curve'</p>	<p>E1</p>	<p>Allow Overestimate AND e.g. 'Does not take into account the curvature of the graph', or 'The lines I have drawn are above the curve' Do not accept e.g. 'Parts of the graph haven't been used'</p>
<p>11(b) Suitable tangent drawn at time 2 seconds Idea of difference in y ÷ difference in x Correct deceleration from difference in y ÷ difference in x in its simplest form</p>	<p>M1 m1 A1</p>	<p>Tangent needs to go through (2, 2) with no 'daylight' between their tangent and the curve If only 1 correct difference seen, then award m1 followed by A0 Allow a negative value Accept a fully simplified improper fraction (unless it gives a whole number), mixed number or decimal. If they give a decimal, it needs to be correctly evaluated to at least 1 decimal place, rounded or truncated Mark final answer</p>