

8300

GCSE MATHEMATICS

Foundation and Higher tier – Questions by Topic – Mark Scheme

Geometry

Scale diagrams – Drawing and interpreting scale diagrams

v1.0

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.

If a student uses a method which is not explicitly covered by the mark scheme the same principles of marking should be applied. Credit should be given to any valid methods. Examiners should seek advice from their senior examiner if in any doubt

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. e.g. accept 0.5 as well as $\frac{1}{2}$
[a, b]	Accept values between a and b inclusive.
3.14...	Allow answers which begin 3.14 e.g. 3.14, 3.142, 3.1416
Use of brackets	It is not necessary to see the bracketed work to award the marks.

Examiners should consistently apply the following principles

Diagrams

Diagrams that have working on them should be treated like normal responses. If a diagram has been written on but the correct response is within the answer space, the work within the answer space should be marked. Working on diagrams that contradicts work within the answer space is not to be considered as choice but as working, and is not, therefore, penalised.

Responses which appear to come from incorrect methods

Whenever there is doubt as to whether a student has used an incorrect method to obtain an answer, as a general principle, the benefit of doubt must be given to the student. In cases where there is no doubt that the answer has come from incorrect working then the student should be penalised.

Questions which ask students to show working

Instructions on marking will be given but usually marks are not awarded to students who show no working.

Questions which do not ask students to show working

As a general principle, a correct response is awarded full marks.

Misread or miscopy

Students often copy values from a question incorrectly. If the examiner thinks that the student has made a genuine misread, then only the accuracy marks (A or B marks), up to a maximum of 2 marks are penalised. The method marks can still be awarded.

Further work

Once the correct answer has been seen, further working may be ignored unless it goes on to contradict the correct answer.

Choice

When a choice of answers and/or methods is given, mark each attempt. If both methods are valid then M marks can be awarded but any incorrect answer or method would result in marks being lost.

Work not replaced

Erased or crossed out work that is still legible should be marked.

Work replaced

Erased or crossed out work that has been replaced is not awarded marks.

Premature approximation

Rounding off too early can lead to inaccuracy in the final answer. This should be penalised by 1 mark unless instructed otherwise.

Q1.

DC or *CD*

B1

Additional Guidance

CDE

B0

C : D

B0

[1]

Q2.

Please note, *actual measurements may have changed slightly on export/printing.*

Alternative method 1 Using the given values

$$4.2 \div 7 \text{ or } 0.6$$

or

$$7 \div 4.2 \text{ or } 1.66... \text{ or } 1.67$$

or

$$2.5 \div 7 \text{ or } 0.357... \text{ or } 0.36$$

or

$$7 \div 2.5 \text{ or } 2.8$$

implied by $1 \rightarrow 0.6$ or $0.5 \rightarrow 0.3$

M1

$$2.5 \times 4.2 \div 7$$

oe eg $2.5 \div (7 \div 4.2)$ or $2.5 \div 1.67$

or $4.2 \div (7 \div 2.5)$ or $4.2 \div 2.8$

or full build-up

eg $0.6 + 0.6 + 0.3$ or 0.3×5

or $4.2 \div 2 - 0.6$

M1dep

$$1.5$$

oe fraction or decimal

SC2 answer with digits 15

A1

Alternative method 2 Working consistently in centimetres

$$4.2 \times 100 \div 7 \text{ or } 60$$

or

$$7 \div (4.2 \times 100)$$

$$\text{or } 0.0166... \text{ or } 0.0167$$

or

$$2.5 \div 7 \text{ or } 0.357... \text{ or } 0.36$$

or

$$7 \div 2.5 \text{ or } 2.8$$

oe eg $420 \div 7$ or $7 \div 420$

implied by $1 \rightarrow 60$ or $0.5 \rightarrow 30$

M1

$$2.5 \times 420 \div 7 \text{ or } 150$$

oe eg $2.5 \div (7 \div 420)$ or $2.5 \div 0.0167$

or $420 \div (7 \div 2.5)$ or $420 \div 2.8$

or full build-up

eg $60 + 60 + 30$ or 30×5

or $420 \div 2 - 60$

M1dep

$$1.5$$

oe fraction or decimal

SC2 answer with digits 15

A1

Additional Guidance

Up to M1 may be awarded for correct work with no, or incorrect answer, even if this is seen amongst multiple attempts

Answer 1.5 with no working

M2A1

150 is M2A0 but Answer 150 cm with m crossed out would be M2A1

4.2 : 1.5 or 420 : 150

M2

For consistent working in millimetres or metres apply the principles of Alt 2

Incorrect or inconsistent change of units must be recovered for M2A0 or M2A1, otherwise score 0 or SC2

eg1 $42 \div 7 = 6$, $6 \times 2.5 = 15$, Answer 1.5 (units recovered)

M2A1

eg2 $4200 \div 7 = 800$, $800 \times 2.5 = 2000$, Answer 2 (arithmetic slip but method shown and units recovered)

M2A0

eg3 $42 \div 7 = 6$, $6 \times 2.5 = 15$, Answer 15 (units never recovered)

SC2

NB Correct values from incorrect methods

eg1 $7 - 4.2 = 2.8$ with no other creditworthy work

M0M0A0

eg2 $2.5 \div 4.2 = 0.6$ (1 dp) with no other creditworthy work

M0M0A0

If rounded or truncated values are used, the final answer must be exactly 1.5

eg1 $2.5 \div 1.66$ Answer 1.5 (may have kept full value on calculator)

M2A1

eg2 $2.5 \div 1.66 = 1.506$ Answer 1.5 (comes from further rounding)

M2A0

[3]

Q3.

Please note, actual measurements may have changed slightly on export/printing.

[17, 21]

B1 for [15, 17] or [21, 23]

B1 for scale factor [9, 12]

B2

[2]

Q4.

Please note, *actual measurements may have changed slightly on export/printing.*

2 (cm) and 8 (cm) seen

each ± 2 mm

or

[3.54, 4.56]

implied by whale divided into four sections or $\frac{1}{4}$ of the whale

or

$3 \div [1.8, 2.2]$ or [1.36, 1.67]

or

$[1.8, 2.2] \div 3$ or [0.6, 0.74]

oe

M1

[10.6, 13.7]

working for M1 must be seen

SC1 [10.6, 13.7] with no or insufficient working

A1

Additional Guidance

2:8 and 3:12 on answer line

M1A0

[2]

Q5.

Alternative method 1

6.5 – 4 or 2.5

M1

50 $\div$ their 2.5

or

$50 \times 100 \div$ their 2.5 or 2000

oe

M1dep

1 cm represents 20 metres

A1

Alternative method 2

80 and 130 seen

M1

$80 \div 4$ with 130 seen

or

$130 \div 6.5$ with 80 seen

oe eg $20 \times 4 = 80$ with 130 seen

M1dep

1 cm represents 20 metres

A1

Additional Guidance

In Alt 1, 65 – 40 unless recovered

M0

In Alt 1, 0.065 – 0.04 unless recovered

M0

In Alt 2, 0.08 and 0.13 unless recovered

M0

[3]

Q6.

Please note, *actual measurements may have changed slightly on export/printing.*

Alternative method 1

2 (cm) and 10 (cm)

or (scale factor =) 5

each ± 0.2 cm

oe implied by 650 in working

130 $\times$ 5

or 130 $\div$ their 2 $\times$ their 10

oe

M1dep

650

ft [1.8, 2.2] and [9.8, 10.2]

SC2 [635, 665]

A1ft

Alternative method 2

2 (cm) and 130 $\div$ their 2

or 65

± 0.2 cm

M1

10 (cm) and their 65 $\times$ their 10

± 0.2 cm

M1dep

650

ft [1.8, 2.2] and [9.8, 10.2]

SC2 [635, 665]

A1ft

Additional Guidance

Do not accept marked graduations on diagram as a scale factor

Allow consistent use of mm throughout

2 and 9.9 followed by 130 $\div$ 2 $\times$ 9.9 with answer 643.5 or 644

M1M1A1ft

130 $\times$ 4 + 124 = 644

SC2

2.1 and 10.1 followed by 130 $\div$ 2.1 $\times$ 10.1

M1M1

130 $\times$ 4 (= 520) + 130

M1M1

(130 $\times$ 5 =) 650 followed by 650 – 130

M1M0

(130 $\times$ 5 =) 650 followed by 130 $\times$ 650 = 84 500

M1M0

1:5 or 5:1 is oe (scale factor =) 5

M1

130 $\times$ 4 (= 520)

M0

[3]

Q7.

Please note, *actual measurements may have changed slightly on export/printing.*

Any room correctly drawn to scale

$\pm 2 \text{ mm}$

or

any outline dimension correctly drawn to scale.

or

any room dimension or outline dimension correctly scaled and clearly related

may be on diagram

M1

At least two rooms correctly drawn to scale in correct position

$\pm 2 \text{ mm}$

or

correctly drawn outline of plan to scale

M1 dep

Fully correct scale drawing with correct room labels

$\pm 2 \text{ mm}$ for outline and internal lines all lines must be ruled

A1

Additional Guidance

For 2nd method mark there should not be a gap shown between rooms correctly drawn to scale in correct position

Fully correct scale drawing with incorrect or missing room labels

M1M1A0

Check original diagram for clearly related scaled dimensions

eg 8 (feet =) 4 (cm)

M1

Any correct outline dimension

M1

eg 16 (feet =) 8 (cm) or 20 (feet =) 10 (cm) or 22 (feet =) 11 (cm)

M1

Fully correct scale drawing with correct room labels



[3]

Q8.

Please note, *actual measurements may have changed slightly on export/printing.*

[4.5, 4.9] (cm) or [45, 49] (mm)

measurement

M1

their measurement $\div 1.5$

or

[4.5, 4.9] $\div 1.5$

or

[45, 49] $\div 15$

or

[3, 3.3]

or

$200 \div 1.5$ or 133.(3...)

oe

M1

600 or 613.(...) or [626, 627] or 640 or 653.(...)

or

correct answer from their [4.5, 4.9] (cm) or their [45, 49] (mm), rounded or truncated

SC2 [600, 660]

A1

Additional Guidance

600 on answer line with no working or measurement shown

M1M1A1

4.7 cm measured

$4.5 \div 1.5 = 3$ and 600

$0.2 \times 200 = 40$ with answer 640 (incorrect scaling method of 0.2 cm)

M1M1A0

Measurement of 4.7 cm with answer 640

(incorrect answer for their measurement)

SC2

200, 200, 200 marked on diagram implies 4.5 and 3

M1M1

200×3 without measurement shown implies 4.5 and 3

M1M1

[3]

Q9.

Please note, *actual measurements may have changed slightly on export/printing.*

(a) [6.9, 7.1] (cm)

B1

[345, 355]

ft their [6.9, 7.1] × 50

B1ft

Additional Guidance

[345, 355] without sight of [6.9, 7.1]

B1B1

(b) R marked [3.9, 4.1] cm
due South of P

B1 for

R marked [3.9, 4.1] cm from P

or

R marked due South of P

or

4 (cm) seen

B2

[4]

Q10.

Please note, *actual measurements may have changed slightly on export/printing.*

[8.4, 8.8] (× 2.5)

M1

[21, 22]

SC1 Any given length in cm correctly multiplied by 2.5

A1

[2]

Q11.

[7.7, 7.9]

B1

their 7.8×50

M1

[385, 395]

A1ft

Additional Guidance

7 cm = 350 km is B0 M1 A1ft

[3]

Q12.

(a) 10

*Accept [9.8, 10.2]***B1**

(b) (AB =) 7.5 (cm)

*Accept [7.3, 7.7]***B1**

160 ÷ their 10 (= 16)

M1

their 7.5 × their 16

*their 16 ≠ 10***M1**

120

*ft their 10 in (a) (**must** score M2)***A1ft****Alternative**

(AB =) 7.5 (cm)

*Accept [7.3, 7.7]***B1**

their 7.5 ÷ their 10 (= 0.75)

*oe***M1**

their 0.75 × 160

M1

120

*ft their 10 in (a) (**must** score M2)***A1ft****[5]****Q13.****Please note,** *actual measurements may have changed slightly on export/printing.*

(a) Vertical line with

height [6.9, 7.1] cm marked

Point marked [2.4, 2.6] cm on base line from RHS (or from base of wall)

Correct ladder drawn

*B1 for first or second criterion met***B2**

(b) [7.2, 7.7]

*ft with a tolerance of ± 2.5 mm (0.25 cm)***B1ft****[3]**

Q14.

1.5 (cm) or 6 (cm) seen

or

scale factor = 4 (can be indicated on diagram)

Accept [1.4, 1.6]

Accept [5.9, 6.1]

Accept [3.6, 4.4]

B1

$2 \times \text{their } 6 \div \text{their } 1.5$ oe

or $2 \times \text{their } [3.6, 4.4]$

M1

8

Accept [7.2, 8.8]

A1

[3]

Q15.

Please note, *actual measurements may have changed slightly on export/printing.*

Point marked on grid North East of A

$\pm 2^\circ$

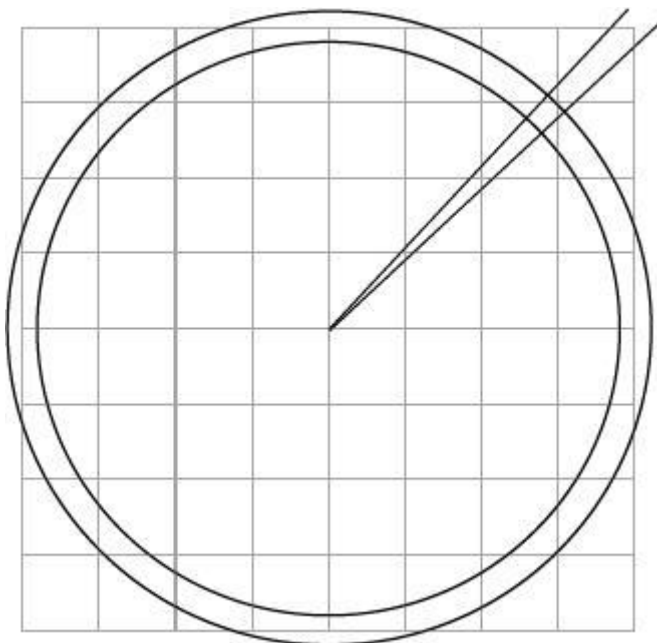
B1

Point marked 4 cm from A

$\pm 2 \text{ mm}$

B1

Additional Guidance



Ignore any North lines marked on grid

Point marked 3 cm right and 3 cm up – condone in tolerance

B1B1

Point marked on top right corner of the grid

B1B0

Assume the end of a line drawn from A with no point marked is their B

The point must be marked or implied by the end of a line from A, just writing the letter B is not enough to indicate the point

B0B0

[2]

Q16.**Please note,** *actual measurements may have changed slightly on export/printing.*

[5.9, 6.1] seen

B1

[4.9, 5.1] seen

B1

48 ÷ their 6

M1

their 5 × their 8 × 250

M1 dep

10 000

*Condone 22000 as further working***A1****[5]****Q17.****Please note,** *actual measurements may have changed slightly on export/printing.*

(a) [208°, 212°]

B1

(b) [6.8, 7.2]

*May be implied by correct answer***B1**

[340, 360]

*ft their [6.8, 7.2] × 50***B1ft****[3]****Q18.****Please note,** *actual measurements may have changed slightly on export/printing.*

(a) Measure [3.8, 4.2]

B1

their [3.8, 4.2] × 80

M1

their [3.8, 4.2] × 80 ÷ 100

M1

[3.04, 3.36] or 3 or 4

*ft their [3.04, 3.36] × 80 ÷ 100***A1ft**

(b) Estimate is low as road not straight

*oe***B1**

Estimate is low if average speed is lower

or

Estimate is high if average speed is higher

*oe***B1****[6]**

Q19.

Please note, *actual measurements may have changed slightly on export/printing.*

(a) No and correct reason

or

No and correct description of correct method

or

No and 280(°)

e.g. No, he has done B from A

No, the North line should go from B

B1

Additional Guidance

Ignore non-contradictory, irrelevant responses alongside a correct response

Answer must either include 'No' or 'Kemal is wrong' or

Ignore diagram if B1 scored from answer lines

No, it is 280

B1

No, should start / measure from B

B1

No, it's from the wrong point

B1

Kemal is wrong, he started from A (and went to B)

B1

No and a correct method/drawing shown in either box

B1

No, the bearing should be reflex

B1

No, he did A to B (not A from B)

B1

No, should be anticlockwise

B0

No, measured the wrong way around

B0

No, bearing would be 260

B0

(It should be) 280 (not sufficient to imply 'no')

B0

No, he measured from A which is 100 but you're meant to measure from B which is 170

B0

Bearing should start from B (should is not sufficient to imply 'no')

B0

Not measured from B

B0

Started from A (and went to B)

B0

No, it's from the wrong place

B0

(b) No and correct reason

e.g. No, it's North East

No, NW is 315(°)

B1

Additional Guidance

Reasoning may be seen on diagram. The angles do not need to be accurate if intention is clear.

No, you've gone anticlockwise

B1

No, NW lies between 270 and 360 (but 045 is between 0 and 90)

B1

No, D is NE of C

B1

Do not accept incorrect statements

e.g. No, North West is 225°

B0

No, C is SW of D (true but not referencing what Nina says)

B0

045 is NE

B0

D is NE of C

B0

No, it will be larger

B0

(c) Line drawn due South from E (any length)

or

[4.3, 5.1]

mark intention on 'south'

mark intention on 'line'

accept a cross on coast roughly south of E

M1

their value $\times 100$

[430, 510] implies M2

e.g. 1.3×100

M1

[450, 490] and correct for their value

SC1 600

[450, 490] scores M1M1A1 unless error seen

A1

Additional Guidance

Line drawn or no line drawn and $4.6 \times 100 = 465$ (within range but not correct for their value)

M1M1A0

No line drawn and $4.2 \times 100 = 420$

M0M1A0

600 may score up to M2, only award SC1 if M0 scored

If line goes North as well as South of E, working must choose the South direction length (in range) for at least 1st M1 (but 2nd M1 could still be scored)

If line does not reach coast or goes beyond coast, full marks can still be awarded for a correct method with correct answer within range

Ignore units throughout e.g. $4.8 \times 100 = 480$ cm

M1M1A1

[5]

Q20.

1 : 100 000

B1

[1]

Q21.

Please note, actual measurements may have changed slightly on export/printing.

(a) 085°

B1

(b) [8, 8.4]

May be implied by correct answer

B1

[640, 672]

ft their [8, 8.4] × 50

B1ft

[3]

Q22.

Please note, actual measurements may have changed slightly on export/printing.

(a) Measure [8, 8.4]

B1

their [8, 8.4] × 80

M1

their [8, 8.4] × 80 ÷ 100

M1

[6.4, 6.72] or 6 or 7

ft their [8, 8.4] × 80 ÷ 100

A1ft

(b) Estimate is low as road not straight

oe

B1

Estimate is low if average speed is lower

or

Estimate is high if average speed is higher

oe

B1

[6]

Q23.

(a) Scale factor $\frac{210}{60}$ or $\frac{60}{210}$
or 2.5 seen

oe

Accept 210 : 60 or 60 : 210

M1

3.5

A1

(b) Between 1° and 2° clockwise

B1

[3]

Q24.

Alternative method 1

$$7 \times 4000 \div 100 \text{ or } 280$$

oe

M1

$$7 \times 4000 \text{ or } 28\,000$$

or

$$7 \div 100 \text{ or } 0.07$$

or

$$4000 \div 100 \text{ or } 40$$

M2

280 and No

oe eg 20 less and No

A1

Alternative method 2

$$300 \times 100 \div 4000 \text{ or } 7.5$$

oe

M1

$$300 \times 100 \text{ or } 30\,000$$

or

$$300 \div 4000 \text{ or } 0.075$$

or

$$100 \div 4000 \text{ or } 0.025$$

M2

7.5 and No

A1

Alternative method 3

$$300 \times 100 \div 7 \text{ or } 4285(.7\dots)$$

or 4286

oe

M1

$$300 \times 100 \text{ or } 30\,000$$

or

$$300 \div 7 \text{ or } [42.8, 42.9]$$

or

$$100 \div 7 \text{ or } [14.2, 14.3]$$

M2

[4200, 4300] and No
with M2 seen

A1

Alternative method 4

$$7 \times 4000 \text{ or } 28\,000$$

oe

M1

$$300 \times 100 \text{ or } 30\,000$$

oe

M1

28 000 and 30 000 and No

A1

Alternative method 5

$$300 \div 4000 \quad \text{or} \quad 0.075$$

oe

M1

$$7 \div 100 \quad \text{or} \quad 0.07$$

oe

M1

0.075 and 0.07 and No

A1**Additional Guidance**

M1 may be awarded for correct work with no answer or incorrect answer, even if this is seen amongst multiple attempts

No may be indicated by selecting the box or a statement in the working lines

No cannot be implied only by an inequality

A correct value is sufficient to show working eg 280 and No (except in alt 3)

M2A1

20 less in alt 1 implies M2

[3]**Q25.**

$$15 \times 20\,000 \div 100 \div 1000$$

oe full method

$$\text{eg } 300\,000 \div 100 \div 1000$$

$$\text{or } 0.2 \times 15$$

$$\text{or } 0.00015 \times 20\,000$$

M1 one correct step

$$\text{eg } 15 \times 20\,000 \text{ or } 300\,000$$

$$\text{or } 20\,000 \div 100 \text{ or } 200$$

$$\text{or } 20\,000 \div 1000 \text{ or } 20$$

$$\text{or } 15 \div 100 \text{ or } 0.15$$

$$\text{or } 15 \div 1000 \text{ or } 0.015$$

$$\text{or } 100 \times 1000 \text{ or } 100\,000$$

M2

3

A1**Additional Guidance**

M1 may be awarded for correct work with no answer or incorrect answer, even if this is seen amongst multiple attempts

M2 will usually be seen in stages

$$\text{eg } 20\,000 \div 100 = 200 \quad 200 \times 15 = 3000 \quad 3000 \div 1000$$

M2

M1 may be seen embedded in more than one step (extra steps could be incorrect)

$$\text{eg } 15 \times 20\,000 \div 100 \quad \text{or} \quad 3000$$

$$\text{or } 15 \times 20\,000 \div 1000 \quad \text{or} \quad 300$$

$$\text{or } 20\,000 \div 100 \div 1000 \quad \text{or} \quad 0.2$$

$$\text{or } 15 \div 100 \div 1000 \quad \text{or} \quad 0.00015$$

M1

Ignore their units for method marks

[3]

Q26.

4.5×5000 or 22 500

or

$5000 \div 100$ or 50

or

$4.5 \div 100$ or 0.045

225

M1

A1

[2]

Q27.

[18, 22]

B1 for [16, 18) or (22, 24]

B1 for scale factor [9, 12]

B2

[2]

Q28.

Please note, *actual measurements may have changed slightly on export/printing.*

Alternative method 1

$$8 \times 1.65 \text{ or } 13.2$$

oe

M1

$$\text{their } 13.2 \div 3.8 \text{ or } [3.47, 3.474]$$

$$\text{or } [3.47, 3.474] \times 100$$

$$\text{or } [347, 347.4]$$

oe

their 13.2 must come from a division or multiplication using 8 and 1.65 only

M1

$$3.47$$

SC2 3.4(0) or 3.5(0)

SC1 50.16 or 1.27 or 1.28

A1

Alternative method 2

$$8 \div 3.8 \text{ or } [2.1, 2.11]$$

oe

M1

$$\text{their } [2.1, 2.11] \times 1.65$$

$$\text{or } [3.465, 3.4815]$$

$$\text{or } [3.465, 3.4815] \times 100$$

$$\text{or } [346.5, 348.15]$$

oe

their [2.1, 2.11] must come from a division or multiplication using 8 and 3.8 only

M1

$$3.47$$

SC2 3.4(0) or 3.5(0)

SC1 50.16 or 1.27 or 1.28

A1

Alternative method 3

$$1.65 \div 3.8 \text{ or } [0.43, 0.434211]$$

oe

M1

$$8 \times \text{their } [0.43, 0.434211]$$

$$\text{or } [3.44, 3.474]$$

$$\text{or } [3.44, 3.474] \times 100$$

$$\text{or } [344, 347.4]$$

oe

M1dep

$$3.47$$

SC2 3.4(0) or 3.5(0)

SC1 50.16 or 1.27 or 1.28

A1

Additional Guidance

Up to M2 may be awarded for correct work, with no or incorrect answer, even if this is seen amongst multiple attempts

In Alt 1 and Alt 2 the 2nd mark is not dependent

In Alt 3 the 2nd mark is dependent

Answer 347 cm or 348 cm with metres crossed out

M1M1A0

Begins by multiplying or dividing by a power of 10

eg1 $800 \times 1.65 \div 3.8$ oe with answer 3.47 (recovered)

M1M1A1

eg2 $8 \times 165 \div 3.8$ oe with answer 347

M1M1A0

eg3 800×1.65 oe with answer 1320

M1M0

eg4 0.8×165 oe

M1

3.47 in working but a different answer on the answer line,

eg 1 3.47 in working but 3 on answer line

M1M1A0

eg 2 3.47 in working but 347 on answer line

M1M1A0

$8 \times 1.65 \div 3.8$ oe

M1M1

$8 \div (3.8 \div 1.65)$

M1M1

$8 \times 1.65 \times 3.8$ oe (which gives 50.16)

M1M0

$8 \div 1.65 \div 3.8$ oe (which gives 1.27 or 1.28)

M0M1

$8 \div 1.65 \times 3.8$ oe (which gives 18.4242...)

M0M0

1.65×3.8 with no other relevant working

M0

[3]

Q29.

Alternative method 1

$0.6 + 0.6 + 1.3 + 0.8 + 1.7$ or 5

oe

condone one missing or incorrect distance

M1

their 5×3 or 15

M1dep

their $15 \times 0.4(0) + 3 \times 1.35$

or $6(.00) + 4.05$

oe working in pence

their 15 can be a truncated or rounded up decimal

M1dep

10.05

SC2 6.05

A1

Alternative method 2

0.6×3 or 1.8 or 1.2×3 or 3.6

or 1.3×3 or 3.9

or 0.8×3 or 2.4

or 1.7×3 or 5.1

M1

$0.6 \times 3 + 0.6 \times 3 + 1.3 \times 3 + 0.8 \times 3 + 1.7 \times 3$

or $1.8 + 1.8 + 3.9 + 2.4 + 5.1$

or 15

oe

condone one missing or incorrect distance

M1dep

their $15 \times 0.4(0) + 3 \times 1.35$

or $6(.00) + 4.05$

oe working in pence

their 15 can be a truncated or rounded up decimal

M1dep

10.05

SC2 6.05

A1

Alternative method 3

0.6×3 or 1.8 or 1.2×3 or 3.6
 or 1.3×3 or 3.9
 or 0.8×3 or 2.4
 or 1.7×3 or 5.1

M1

$0.6 \times 3 \times 0.4$ or 0.72
 or $1.2 \times 3 \times 0.4$ or 1.44
 or $1.3 \times 3 \times 0.4$ or 1.56
 or $0.8 \times 3 \times 0.4$ or 0.96
 or $1.7 \times 3 \times 0.4$ or 2.04

*oe working in pence***M1dep**

$0.6 \times 3 \times 0.4 \times 2 + 1.3 \times 3 \times 0.4 + 0.8 \times 3 \times 0.4 + 1.7 \times 3 \times 0.4 + 3 \times 1.35$
 or
 $0.72 \times 2 + 1.56 + 0.96 + 2.04 + 3 \times 1.35$
 or
 $6(.00) + 4.05$

*oe working in pence**condone one missing or incorrect distance***M1dep**

10.05

*SC2 6.05***A1****Additional Guidance**

Units must be consistent unless recovered

All correct except for missing the return distance from A

eg

 $0.6 + 1.3 + 0.8 + 1.7$ or 4.4 $4.4 \times 3 = 13.2$ $13.2 \times 0.4 + 3 \times 1.35 = 9.33$ **M1M1M1A0**

Example using their 15 truncated or rounded up for each mile

 $0.6 + 1.3 + 0.8 + 1.7$ or 4.4 $4.4 \times 3 = 13.2$ $13 \times 0.4 + 3 \times 1.35 = 9.25$ or $14 \times 0.4 + 3 \times 1.35 = 9.65$ **M1M1M1A0** $3.6 + 3.9 + 5.1$ (BC missing)**M1M1** $3.9 + 2.4 + 5.1$ without further working (TA and AT missing)**M1M0****[4]**

Q30.

Please note, *actual measurements may have changed slightly on export/printing.*

(a) 3×500 or 1500

actual radius of circle in metres

M1

$(\text{their } 1500)^2 \times \pi \times 17$

or 38250000π

M1dep

[120000000, 120200000]

or $[1.2 \times 10^8, 1.202 \times 10^8]$

accept in words eg 120 million

SC1 [480, 481] or [0.048, 0.0481]

A1

Additional Guidance

Do not award A mark if incorrect further work is seen

(b) It could be less than or greater than Virat's estimate (3rd box ticked)
and

statement that area is larger but depth is smaller

B1

It is less than Virat's estimate (1st box ticked) and statement that depth is smaller

or

It is greater than Virat's estimate (2nd box ticked) and statement that area is larger

or

It could be less than or greater than Virat's estimate (3rd box ticked) and statement that depth is smaller

or

It could be less than or greater than Virat's estimate (3rd box ticked) and statement that area is larger

Additional Guidance

For B2 their statement must refer to larger area and smaller depth

For B1 their statement must correctly refer to larger area or smaller depth for their box ticked

Examples of statements implying actual depth is smaller:

height is less

depth is lower

it is shallower

Virat's estimate of the depth is bigger

Examples of statements implying actual area is larger:

the width is bigger

cross section is bigger

shape is greater

Virat's estimate of the area is smaller

The reservoir could be bigger or smaller

B0

The reservoir is larger

B0

We do not know the depth

B0

[5]

Q31.

100 cm = 1 m and 1000 m = 1 km

or 1 km = 100 000 cm

or $2 \times 200\,000$ or 400 000

or $200\,000 \div 100\,000$

or 200 000 cm = 2 km

Conversions can be seen or implied

M1

4

A1

[2]

Q32.

1 km = 1000 m

or 1m = 100 cm

or 1 km = 100 000 cm seen or implied

eg 2000 m

200 000 (cm)

0.05 m

0.000 05 (km)

M1

5 : 200 000

or $200\,000 \div 5$

oe

M1dep

1 : 40 000

A1

[3]

Q33.

(a) 180

B1

(b) 30

B1

[2]

Q34.

Alternative method 1

10×40 or 400

or

18×40 or 720

M1

$10 \times 40 \times 18 \times 40$

oe implies M2

M1dep

288 000

implies M2A1

A1

Kitchen

*correct decision for their area with M2 awarded
accept 300 000 for Kitchen*

A1ft

Alternative method 2

10×18 or 180

and

40^2 or 1600

oe

M1

$10 \times 18 \times 40^2$

or

10×18 **and** $300\,000 \div 40^2$

*$10 \times 18 \times 40$ **and** $300\,000 \div 40$
implies M2*

M1dep

288 000

or

180 **and** 187.5

or

7200 **and** 7500

implies M2A1

A1

Kitchen

*correct decision for their area with M2 awarded
accept 300 000 for Kitchen*

A1ft

Alternative method 3 (working in metres)

$$0.1 \times 40 \text{ or } 4$$

or

$$0.18 \times 40 \text{ or } 7.2$$

M1

$$0.1 \times 40 \times 0.18 \times 40 \text{ or } 28.8$$

oe implies M2

M1dep

$$28.8 \text{ and } 30$$

implies M2A1

A1

Kitchen

*correct decision for their area with M2 awarded
accept 300 000 for Kitchen*

A1ft

Alternative method 4 (working in metres)

$$0.1 \times 0.18 \text{ or } 0.018$$

and

$$40^2 \text{ or } 1600$$

oe

M1

$$0.1 \times 0.18 \times 40^2 \text{ or } 28.8$$

or

$$0.1 \times 0.18 \text{ and } 30 \div 40^2$$

0.1 \times 0.18 \times 40 \text{ and } 30 \div 40
implies M2

M1dep

$$28.8 \text{ and } 30$$

or

$$0.018 \text{ and } 0.01875$$

or

$$0.72 \text{ and } 0.75$$

implies M2A1

A1

Kitchen

*correct decision for their area with M2 awarded
accept 300 000 for Kitchen*

A1ft

Additional Guidance

288 000 and Kitchen

M1M1A1A1

288 000

M1M1A1

$10 \times 40 = 4000$, $18 \times 40 = 720$ and 2 880 000 and Bedroom

M1M1A0A1ft

4000 and 720 and 2 880 000 and Bedroom (only 720 scores)

M1M0A0A0ft

Ignore any incorrect attempt to subtract 288 000 from 300 000

Any attempt to change units must be correct

NB $10 \times 40 = 400$, $10 \times 18 = 180$

M1

$400 \times 180 = 72\,000$ and $300\,000 - 72\,000 = 228\,000$ and Kitchen

M0A0A0

[4]

Q35.

Please note, *actual measurements may have changed slightly on export/printing.*

(a) **Alternative method 1** shown by valid calculation

$$1500 \times 100$$

$$\text{or } 30\,000 \times 5$$

$$\text{or } 1500 \div 5$$

$$\text{or } 30\,000 \div 100$$

$$\text{or } 5 \div 100$$

$$\text{or } 1500 \times 100 \div 5$$

$$\text{or } 30\,000 \times 5 \div 100$$

$$\text{or } 1500 \times 100 \div 30\,000$$

must see one of these calculations but may evaluate

incorrectly for M1

*do **not** allow embedded in an invalid calculation eg $30\,000 \times 5 \div 1000$ is M0*

M1

$$\frac{1500 \times 100}{30\,000} = 30\,000$$

or

$$\frac{30\,000 \times 5}{100} = 1500$$

or

$$\frac{1500 \times 100}{30\,000} = 5 \text{ and } AB = 5$$

or

$$1500 \times 100 = 30\,000 \times 5$$

or

$$1500 \div 5 = 30\,000 \div 100$$

must show correct use of all four of 1500, 100, 5 and 30 000

may be in two stages

*eg $1500 \times 100 = 150\,000$ **and***

$$150\,000 \div 5 = 30\,000$$

*or $1500 \div 5 = 300$ **and***

$$30\,000 \div 100 = 300$$

if units shown must be correct for A1

A1

Alternative method 2 shown by unit conversion and valid calculation

150 000 cm or 300 m

or 0.05 m

correct units must be shown to imply use of 100

M1

150 000 cm **and**

$30\,000 \times 5 = 150\,000$

or

150 000 cm **and**

$150\,000 \div 5 = 30\,000$

or

150 000 cm **and**

$150\,000 \div 30\,000 = 5$ **and** $AB = 5$

or

30 000 cm **and** 300 m

and $1500 \div 5 = 300$

or

30 000 cm **and** 300 m

and $300 \times 5 = 1500$

or

30 000 cm **and** 300 m

and $1500 \div 300 = 5$ **and** $AB = 5$

or

0.05 m **and** $1500 \div 0.05 = 30\,000$

or

0.05 m **and** $30\,000 \times 0.05 = 1500$

correct units must be shown

A1

Additional Guidance

$30\,000 \times 5$ may be seen as a correct build-up ie 30 000, 60 000, 90 000, 120 000, 150 000

Measuring AB as a value other than 5 will score M1 max

Using AC or BC can only score a max of M1 for one of the calculations or conversions that does not use AB

Allow M1 even if seen among other incorrect work but for A1 their method must be all correct and unambiguous

Must show a calculation from Alt 1 or a value with units from Alt 2 for the M1 ie 150 000 only or 300 only or 0.05 only is M0

Ignore any additional reference to the grid having 100 squares

(b) **Alternative method 1** working in cm

[4.4, 4.6]

may be on diagram

B1

their [4.4, 4.6] $\times 30\,000$

or [132 000, 138 000]

*their AC must be in the range [4, 7] and must **not** be 5*

[132 000, 138 000] implies B1M1 if no measurement for AC given

M1

their [132 000, 138 000]

$\div 100 \div 1000$

oe must be converting into km

M1dep

[1.32, 1.38]

ft B0M2

A1ft

Alternative method 2 working in cm

[4.4, 4.6]

may be on diagram

B1

their [4.4, 4.6]

5 $\times 1500$

or their [4.4, 4.6] $\times 300$

or [1320, 1380]

*their AC must be in the range [4, 7] and must **not** be 5*

[1320, 1380] implies B1M1 if no measurement for AC given

M1

their [1320, 1380] $\div 1000$

oe must be converting into km

M1dep

[1.32, 1.38]

ft B0M2

A1ft

Alternative method 3 working in mm

[44, 46]

may be on diagram

B1

their [44, 46] $\times$ 30 000

or [1 320 000, 1 380 000]

their [44, 46]

or 50 $\times$ 1500

or their [44, 46] $\times$ 30

or [1320, 1380]

*their AC must be in the range [40, 70] and must **not** be 50*

[1 320 000, 1 380 000] implies B1M1 if no measurement for AC given

[1320, 1380] implies B1M1 if no measurement for AC given

M1

their [1 320 000, 1 380 000]

$\div 10 \div 100 \div 1000$

or

their [1320, 1380] $\div 1000$

oe must be converting into km

M1dep

[1.32, 1.38]

ft B0M2

A1ft

Additional Guidance

Answer only in range [1.32, 1.38]

B1M1M1A1

Answer must match their AC if seen

Must be using the scale 1 : 30 000 or 5 : 1500

Their [4.4, 4.6] is often 4 (perhaps counting squares crossed diagonally) or 6 (perhaps 2 down and 4 across)

4 seen and answer 1.2

B0M1M1A1ft

4 seen and 120 000 (by Alt 1) or 4 seen and 1200 (by Alt 2)

B0M1M0A0

Answer 1.2 (without 4 seen)

Zero

6 seen and answer 1.8

B0M1M1A1ft

6 seen and 180 000 (by Alt 1) or 6 seen and 1800 (by Alt 2)

B0M1M0A0

Answer 1.8 (without 6 seen)

Zero

4.7 seen and answer 1.41

B0M1M1A1ft

4.7 seen and 141 000 (by Alt 1) or 4.7 seen and 1410 (by Alt 2)

B0M1M0A0

Answer 1.41 (without 4.7 seen)

Zero

Using Pythagoras gives $AC = \sqrt{20}$ or $2\sqrt{5}$ or 4.4(72...) or 4.5

B1

[6]

Q36.

Please note, *actual measurements may have changed slightly on export/printing.*

(a) 270

B1

(b) **Alternative method 1 (working in cm)**

[6.3, 6.7]

implied by 1300

B1

[2.5, 2.9] and [1.8, 2.2]

implied by 540 and 400

or

[4.5, 4.9]

implied by 940

B1

their 6.5×200 or 1300

and their 2.7×200 or 540

and their 2×200 or 400

or

their 6.5×200 or 1300

and (their $2.7 +$ their 2) $\times 200$ or 940

or

their 6.5×200 or 1300

and their 4.7×200 or 940

oe

1300 and 540 and 400 implies B2M1

1300 and 940 implies B2M1

distances must be exact if measurements not shown

if only one value used for BC from the start, their 4.7 must be $>$

4 and < 6

M1

their 1300 – their 540 – their 400

or

their 1300 – their 940

oe

may be implied by correct answer for their distances

their 940 must be > 800 and < 1200

M1dep

Correct answer for their 6.5 and their 2.7 and their 2 with all measurements seen

or

Correct answer for their 6.5 and their 4.7 with all measurements seen

ft their measurements

their 4.7 must be > 4 and < 6

A1ft

Alternative method 2 (working in cm)

[6.3, 6.7]

B1

[2.5, 2.9] and [1.8, 2.2]

or

[4.5, 4.9]

B1

their 6.5 – their 2.7 – their 2

or their 6.5 – their 4.7 or 1.8

oe

if only one value used for BC from the start, their 4.7 must be > 4 and < 6

M1their 1.8×200

oe

may be implied by correct answer

M1dep

Correct answer for their 6.5 and their 2.7 and their 2 with all measurements seen

or

Correct answer for their 6.5 and their 4.7 with all measurements seen

their 4.7 must be > 4 and < 6

Additional Guidance

Allow work in mm but note that they must multiply by 20 for the M1

Working may be on diagram

Must show measurements to score the A mark and answer must be correct for their original measurements

1300 – 940 and answer 360 (no measurements)

B1B1M1M1A0

1300 – 920 and answer 380 (no measurements)

B1B0M0M0A0

6.5, 4.6, 1300 – 920 and answer 380

B1B1M1M1A1ft

6.5, 4.2, 1300 – 840 and answer 460

B1B0M1M1A1ft

6.5, 2.6, 2 on diagram, $1300 - 5 \times 200$ (5 wrong for their values and addition not shown)

B1B1M0M0A0ft**[5]****Q37.**

100 cm = 1 m and 1000 m = 1 km

or 1 km = 100 000 cm

or $2.5 \times 200\,000$ or 500 000or $200\,000 \div 100\,000$

or 200 000 cm = 2 km

M1

5

A1**[2]**

Q38.

1 : 200

B1

[1]

Q39.

1 km = 1000 m

or 1m = 100 cm

or 1 km = 100 000 cm

seen or implied

eg 1200 m

120 000 (cm)

0.06 m

0. 000 06 (km)

M1

6 : 120 000

or 120 000 ÷ 6

oe

M1dep

1 : 20 000

A1

[3]

Q40.

(a) 7.5 (cm)

[7.4, 7.6]

B1

their 7.5×25

their 7.5 must be ≤ 11

M1

[185, 190]

ft their 7.5 cm

A1ft

(b) Correct bearing seen or implied

Line or point

M1

Point marked

2 mm tolerance

A1

[5]

Q41.

(a) $20\,000 \div 100$

200

M1

A1

(b) 5.5 seen

B1

their 5.5×4

Do not accept 6×4

or their min $\times 4$

$5.5 < \text{min} < 6$

M1

22

SC2 for 26

A1ft

[5]

Q42.

(a) $250\,000 \div 100$ or 2500

or $250\,000 \div 1000$ or 250

100×1000 or $100\,000$

M1

$250\,000 \div 100 \div 1000$

$250\,000 \div \text{their } 100\,000$

M1dep

2.5

A1

(b) 5.5 seen

B1

5.5×4

Do not accept 6×4

or their min $\times 4$

$5.5 < \text{min} < 6$

M1

22

SC2 for 26

A1ft

[6]

Q43.

$$8 \times 500\,000 \text{ or } 4\,000\,000$$

*1 km = 1000 m **and** 1 m = 100 cm seen
or 1 km = 100 000 cm seen or implied*

M1

$$8 \times 500\,000 \div 100 \text{ oe}$$

$$\text{or } 8 \times 500\,000 \div 1000$$

$$\text{or } 8 \times 500\,000 \div 100\,000$$

M1dep

40

A1

Alternative method

$$\text{or } 500\,000 \div 1000 \text{ or } 500$$

*1 km = 1000 m **and** 1 m = 100 cm seen*

$$\text{or } 500\,000 \div 100 \text{ or } 5000$$

or 1 km = 100 000 cm seen or implied

$$\text{or } 8 \div 100 \text{ or } 0.08$$

$$\text{or } 8 \div 1000 \text{ or } 0.008$$

M1

$$\text{or } 500\,000 \div 100\,000 \text{ or } 5$$

$$\text{or } 500\,000 \div 1000 \times 8 \text{ or } 4000$$

$$\text{or } 500\,000 \div 100 \times 8 \text{ or } 40\,000$$

$$\text{or } 500\,000 \div 100 \div 1000$$

$$\text{or } 8 \div 100\,000 \text{ or } 0.000\,08$$

M1dep

40

A1

[3]

Q44.

[5.9, 6.1] seen

B1

their $6 \times 800 (\div 100)$ oe

or 1 cm = 8 m seen or implied

M1

$$\text{their } 6 \times 800 \div 100 \times 250$$

M1dep

12 000

[11 800, 12 200]

Digits 12 or 118 or 122 imply B1M1

A1

[4]

Q45.

Please note, *actual measurements may have changed slightly on export/printing.*

- (a) Circle with diameter 4 cm

diameter ± 5 mm

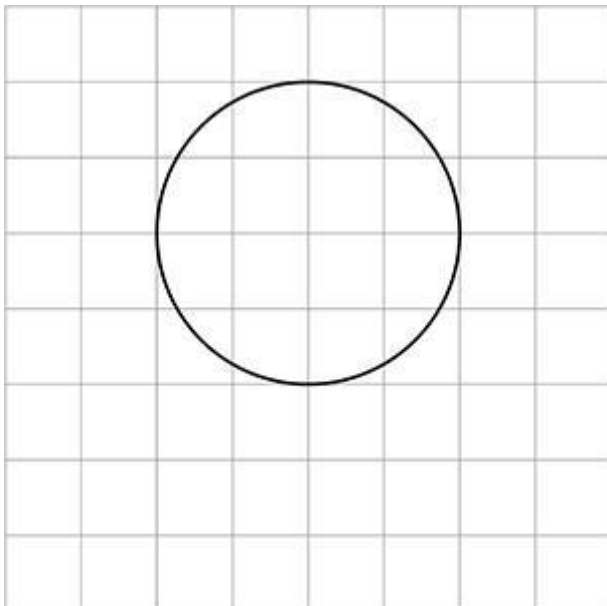
B1 for any circle

or $40 \div 10$ or 4

or (radius =) 2

B2

Additional Guidance



Can be anywhere on the grid

B2

Mark intention

Check stem and part (b) for evidence of 4 or 2

4 or 2 cannot be implied from a diagram for B1

- (b) Rectangle with horizontal sides

4 cm and vertical sides 5.5 cm

± 2 mm

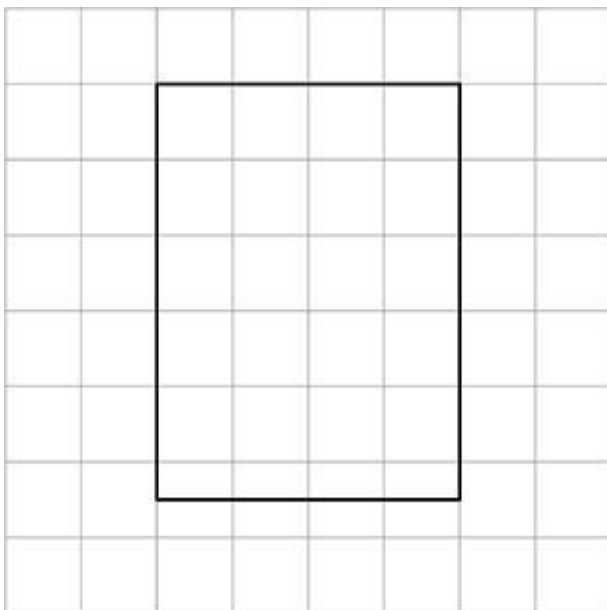
B1 for any rectangle or

*$40 \div 10$ or 4 **and** $55 \div 10$ or 5.5*

SC2 for correct answers in (a) and (b) reversed (award 0 in (a) and 2 in (b))

B2

Additional Guidance



Can be anywhere on the grid

B2

Mark intention

Do not accept curved corners on any rectangle

Check stem and part (a) for evidence of 4 and 5.5

4 and 5.5 cannot be implied from a diagram for B1

[4]

Q46.

Please note, actual measurements may have changed slightly on export/printing.

Arc, centre P , radius [6.8, 7.2] cm

from use of compasses, mark intention

B1

Two intersections from arcs with equal radii, centres P and Q

tolerance 2 mm

M1

Perpendicular bisector of PQ with M1 seen

A1

Correct region shown (arcs for bisector not required)

allow any clear indication of region

B1

Additional Guidance

Arc, centre P , radius [6.8, 7.2] cm and correct region indicated but arcs for bisector not seen

B1M0A0B1

For A1 the perpendicular bisector of PQ must be long enough to provide the straight boundary of the correct region

Ignore redundant or incorrect lines/arcs

[4]

Q47.

Please note, *actual measurements may have changed slightly on export/printing.*

Pair of intersecting arcs, equal radii $>$ half XY , above and below XY

M1

Perpendicular bisector of XY drawn with correct construction

A1

Arc, centre X , radius $[5.8, 6.2]$ cm

B1

Correct region identified

ft region to right of their perpendicular bisector and inside their arc

B1ft

[4]

Q48.

Side of length [7.8, 8.2] cm drawn

B1

Correct construction with intersecting arcs, same radius as their base ± 2 mm to identify the third vertex

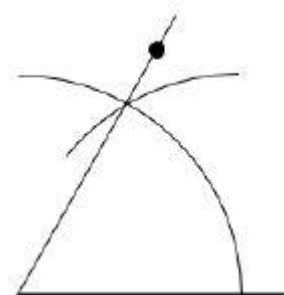


or

correct construction with intersecting arcs, equal radii ± 2 mm, line drawn at 60° and third vertex correctly positioned



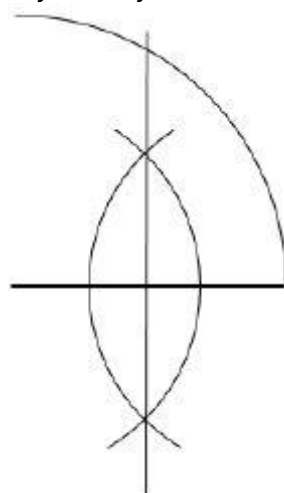
or



M1

or

correct construction with intersecting arcs, equal radii ± 2 mm and construction arc drawn to correctly identify the third vertex



M1

Triangle with equal sides [7.8, 8.2], with correct construction seen

ft B0M1 triangle with equal sides ± 2 mm, with correct construction seen

A1ft

Additional Guidance

No construction arcs drawn can score a maximum of B1

[3]

Q49.

Please note, *actual measurements may have changed slightly on export/printing.*

Arc radius [3.8, 4.2] cm centre P

or

arc radius [4.8, 5.2] cm centre Q

only need arcs within tolerance for the correct region

ignore other lines

M1 arc radius [3.8, 4.2] cm centre Q

and

arc radius [4.8, 5.2] cm centre P

and

correct ft region identified

M1

Arc radius [3.8, 4.2] cm centre P

and

arc radius [4.8, 5.2] cm centre Q

and

region identified

only need arcs within tolerance for the correct region

ignore other lines

A1

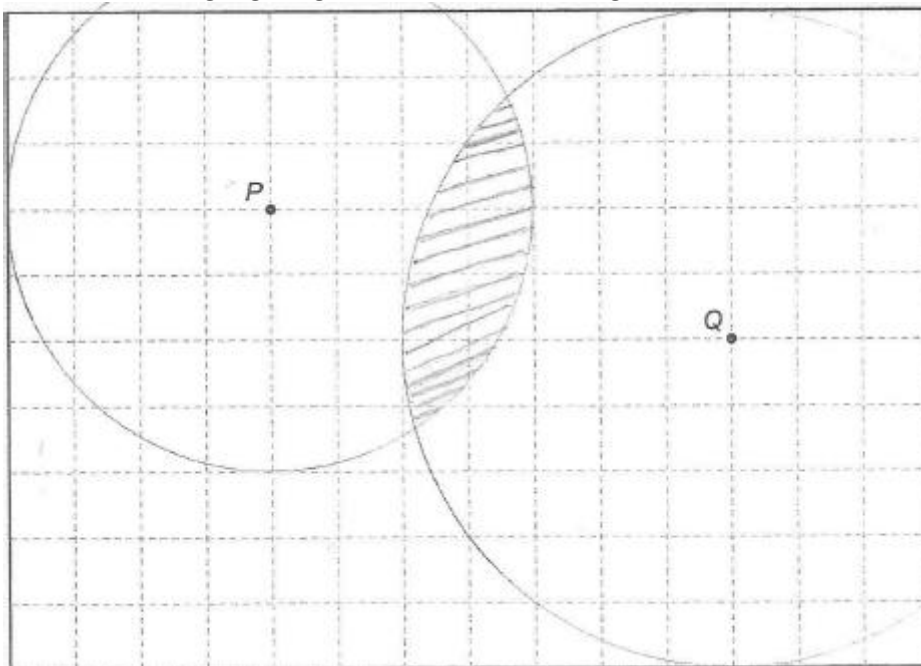
Additional Guidance

Arcs may go outside the rectangle

Allow any unambiguous indication of the region

eg labelled R or appropriate shading

Do not accept highlighting the perimeter of the region for identification of the region



M1A1

[2]

Q50.

Alternative method 1

$$\tan 25 (= \frac{x}{30})$$

M1

$$30 \tan 25 \text{ or } [13.9, 14]$$

M1

$$30 \tan 25 \div 3 \times 5$$

$$\text{or } [4.6, 4.7] \times 5$$

$$\text{or their height} \div 3 \times 5$$

M1

$$[23.3, 23.4]$$

Accept 23

A1

Alternative method 2

$$\frac{30}{\sin 65} = \frac{b}{\sin 25}$$

M1

$$\frac{30 \sin 25}{\sin 65} \text{ or } [13.9, 14]$$

M1

$$\frac{30 \sin 25}{\sin 65} \div 3 \times 5$$

$$\text{or } [4.6, 4.7] \times 5$$

$$\text{or their height} \div 3 \times 5$$

M1

$$[23.3, 23.4]$$

Accept 23

A1

Alternative method 3

$$30 \div 3 \times 5 \text{ or } 50$$

M1

$$\tan 25 (= \frac{x}{50})$$

M1

$$50 \tan 25$$

M1

$$[23.3, 23.4]$$

Accept 23

A1

Additional Guidance

$$50 \tan 25 \text{ or } \frac{50 \sin 25}{\sin 65}$$

M1M1M1A0

[4]

Q51.

- (a)
- $(AB =) [9.8, 10.2]$
- (cm)
- or**

(1 cm represents)

 $[24.5, 25.5102041]$ (metres)*oe eg [3.9, 4.1] inches**May be seen on diagram***M1** $(AC =) 175 \div 250 \times \text{their } [9.8, 10.2]$ $(= [6.86, 7.14])$ (cm))*oe eg $175 \div \text{their } [24.5, 25.5102041]$* *(= [6.86, 7.14] (cm))**May be seen on diagram***M1**AC drawn with C on North line through B with $AC = [6.86, 7.14]$ *SC3 AC drawn with C on North line through B within tolerance**shown on the overlay***A1**

- (b) Two arcs centre P with equal radii intersecting PQ and PS

*oe eg single arc intersecting PQ and PS**Allow intersection at Q***M1**Two intersecting arcs with equal radii **and** line from P to point of intersection*SC1 M0 but line within tolerance***A1****[5]****Q52.**

- (a) 2 or 2.0

B1

- (b) Circular arc drawn centre post

M1

Fully correct arc radius 5 cm

 ± 2 mm tolerance**A1**

- (c) 2 cm = 1 metre

Any equivalent scale

or 1 cm = 0.5 metre

*Condone 1 square = 0.5 metre***M1**

1 cm = 50 cm or 2 cm = 100 cm

Any order

or 2 : 100

*Common units***M1**

1 : 50

*50 : 1 implies M1M1A0***A1****[6]**