

8300

GCSE MATHEMATICS

Foundation and Higher tier – Questions by Topic – Mark Scheme

Geometry

Area and perimeter – Finding the area of triangles

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.

$$\frac{1}{2} \times 20 \times 6.3$$

oe

63

M1

A1

Additional Guidance

Ignore units

[2]

Q2.

$$0.5 \times 2.6 \times 9.8$$

oe

eg 1.3×9.8 or 2.6×4.9

12.7(4)

M1

A1

Additional Guidance

Accept 13 with M1 awarded

M1A1

[2]

Q3.

$$\frac{1}{2} \times 5 \times 8$$

oe

20

M1

A1

[2]

Q4.

Valid criticism

eg the formula is $\frac{1}{2} \times \text{base} \times \text{height}$
or the answer is double the correct answer

or he has forgotten the $\frac{1}{2}$

or it should be $\frac{1}{2} \times 12 \times 8$
or it should be 48

B1

Additional Guidance

He needs to halve 12 (which is 6, $6 \times 8 = 48$)

B1

He hasn't halved the base

B1

$0.5 \times 12 \times 8 = 48$

B1

His method was to work out a rectangle (insufficient)

B0

He should divide by half

B0

He didn't use the area of a triangle formula

B0

He should have timesed all the measurements and divided by 2

B0

Ignore irrelevant statements alongside a correct statement

eg1 he has forgotten to divide by 2, the base should be shorter

B1

eg2 should have divided by 2, he worked out the area of a rectangle

B1

Two statements, one correct, one incorrect

eg1 he has forgotten to divide by 2, it should be $14 \times 8 \div 2$

B0

eg2 should have divided by 2, he worked out the area of a square

B0

eg3 forgot to halve the base, should have been $6 \times 8 = 49$

B0

[1]

Q5.

$$\frac{1}{2} \times 9.5 \times 7.3 \text{ or } \frac{1}{2} \times 69.35$$

oe

34.67(5)

34.7

*ft their answer if 2 or more dp seen
SC2 for 34.7 coming from premature rounding or
approximation seen*

M1

A1

B1ft

[3]

Q6.

$$\frac{1}{2} \times 8.6 \times 5.2$$

oe

22.36

22.4

ft from 2 d.p. or more

M1

A1

B1ft

[3]

Q7.

$$0.5 \times 9 \times 5.6$$

oe

25.2

Additional Guidance

25 on answer line with 25.2 in working

25 on answer line with no or incorrect working

M1

A1

M1A1

M0

[2]

Q8.

Rectangle: 4

B1

Triangle: $0.5 \times ? \times 16 = 24$

or $(2 \times) 24 \div 16$

or $(2 \times) 1.5$

or 2×24 or 48

oe

M1

3

A1

Additional Guidance

Ignore any units given

[3]

Q9.

4 (cm) **and** 6 (cm) seen

[3.9, 4.1], [5.9, 6.1]

Accept measurements in mm, ie [39, 41] and [59, 61] Units need not be stated

B1

$0.5 \times$ their 4 $\times$ their 6

$0.5 \times$ their 4 $\times$ their 6 $\times \sin 90$

M1

[11.5, 12.5]

Accept answer only for full marks

A1ft

[3]

Q10.

- (a) Right-angled triangle ABC drawn with
 A at $(-3, -2)$
 and
 B at $(1, -2)$
 and
 C at $(-3, 4)$ or $(1, 4)$

B2 for

A, B and C correctly plotted with no triangle drawn

or

*A and B correctly plotted and a right-angled triangle drawn
 with A and B at two of the vertices*

or

*C plotted on the line $y = 4$ and a right-angled triangle drawn
 with C at one of the vertices*

or

*A and B correctly plotted with C plotted at $(k, 4)$ with $k \neq -3$ or 1
 and triangle ABC drawn*

B1 for

A and B correctly plotted

or

C plotted on the line $y = 4$

or

a right-angled triangle drawn

B3

Additional Guidance

Condone incorrect or omitted labelling

- (b) **Alternative method 1**

$\frac{1}{2}$

$\times$ their base $\times$ their height

M1

12

ft their triangle

A1ft

Alternative method 2

Evidence of counting squares seen

M1

12

ft their triangle

A1ft

[5]

Q11.

(a) A

B1

(b) $\frac{1}{2} \times 3 \times 3$ or $3 + 0.5 + 0.5 + 0.5$ oe

M1

4.5 oe

*SC1 for Area A = 3
or Area C = 4*

A1

cm²

B1

[4]

Q12.

$0.5 \times 10 \times 12$ or 60

oe

M1

$180 \div$ their 60

M1dep

3

SC1 1.5 oe

A1

[3]