

8300

GCSE MATHEMATICS

Foundation tier – Questions by Topic – Mark Scheme

Number

Using a written method to multiply decimals

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.

$$1.5 \times 1.5$$

or

$$\left(\frac{3}{2}\right)^2$$

oe

oe improper fraction squared

M1

$$2.25 \text{ or } \frac{9}{4} \text{ or } 2\frac{1}{4}$$

oe decimal, improper fraction or mixed number
SC1 answer digits 225

A1

Additional Guidance

Ignore attempt to simplify or convert if correct fraction seen

Do not allow further work but condone adjusting place value

eg $1.5 \times 1.5 = 2.25$, $2.25 \div 100 = 0.0225$ (adjusting place value)

M1A0

eg $1.5 \times 1.5 = 2.25$, 2.25×1.5 (cubing not squaring)

M0A0

$$1.5 \times 1.5 = 3$$

M1A0

$$2.25^2$$

M1A0

$$225^2$$

M0A0

[2]

Q2.

$$(0).35$$

oe

B1

Additional Guidance

Mark the answer line. If this is blank, mark the working

If values are given in one or more forms, either on the answer line or in working with nothing on the answer line, all values must be correct

eg1 $0.35 = \frac{7}{20}$ on answer line

B1

eg2 $\frac{35}{100}$ and 3.5 in working with $\frac{35}{100}$ on answer line

B1

eg3 $\frac{35}{100}$ and 3.5 in working with 3.5 on answer line

B0

eg4 $\frac{35}{100}$ and 3.5 in working with answer line blank B1

B0

[1]

Q3.

10

100

B1

B1

[2]

Q4.

(b) 0.08

*oe
eg .08*

B1

[1]

Q5.

40.87

B1

[1]

Q6.

10

B1

[1]

Q7.

20

3.7

*ft 23.7 – their 20
SC1 169.6*

B1

B1ft

[2]

Q8.

(a) (0).06 or $\frac{6}{100}$

oe decimal or fraction

B1

[1]

Q9.

(b) 18.72

oe e.g. 18.720

B1

[3]

Q10.

- (a) 0.0048
(b) 0.000 012
(c) 2.5×10^6

B1

B1

B1

[3]

Q11.

- (a) 1000

B1

[1]

Q12.

Alternative method 1

222 or 740 with the 0 correct for the multiplication by 20
or

182 or 780 with the 0 correct for the multiplication by 30
values may be seen separately or in rows
ignore any decimal points

M1

their 222 + their 740

or

their 182 + their 780

ignore any decimal points

M1dep

digits 962

A1

0.0962

ft their digits 962 $\div$ 10 000

B1ft

Alternative method 2

At least three of

600, 140, 180 and 42

may be seen in a grid
ignore any decimal points

M1

their 600 + their 140 + their 180 + their 42

ignore any decimal points

M1dep

digits 962

A1

0.0962

ft their digits 962 $\div$ 10 000

B1ft

Alternative method 3

3	7	
0 6	1 4	2
1 8	4 2	6

*at least three of the calculated values correct
ignore any decimal points*

M1

Total calculated correctly for each diagonal for their table
ignore any decimal points

M1dep

digits 962

A1

0.0962

ft their digits $962 \div 10\,000$

B1ft

Additional Guidance

Ignore use of a decimal point anywhere until final mark

Use the Alt that gives the best mark

B1ft is not available for an answer involving digits 962, other than correct answer 0.0962

$30 \times 20 + 7 \times 6 = 642$, answer 0.0642

M0M0A0B1ft

Using fractions, digits 962 may be seen as part of a fraction for first A1

For unsimplified fractions, follow appropriate MS for M marks

For simplified fractions, please follow the spirit of each MS for M marks

Alt 1 If the 0 is missing or misaligned allow if units digit 2 in their answer for the first M1

If the 0 is missing allow 0 to be replaced by x for the first M1

Alt 2 If numbers are broken down further there can be only one error for the first M1

eg 20 10 7 and 20 6 needs five of 400, 120, 200, 60, 140, 42

Alt 3 Diagonals must slope consistently for M1 unless recovered

Diagonals missing is M0 unless recovered

[4]

Q13.

Two decimals less than 1 with product 0.06
 eg 0.3 and 0.2 or 0.60 and 0.10
 or 0.5 and 0.12 or 0.75 and 0.08
 either order

B1**Additional Guidance**

Accept negatives eg -0.3 and -0.2

Condone negative integers eg -6 and -0.01

B1

0.06 and 1

B0

6 and 0.01

B0

$$\frac{3}{10} \text{ and } \frac{2}{10}$$

B0**[1]****Q14.**

0.84

$$\text{oe } \frac{84}{100}$$

B1

17 ÷ 20 attempted

$$\frac{17 \times 5}{20 \times 5}$$

M1

0.85

$$\frac{85}{100}$$

A1

$$\frac{17}{20}$$

selected and 0.84 and 0.85

oe QWC – Strand (iii) – Writing both as decimals or percentages
 or both as fractions with same denominator and correct
 decision for their working

Q1**Alternative**

0.84

$$\text{oe } \frac{84}{100}$$

B1

$$\frac{17 \text{ or } 85 \div 5}{20}$$

M1

$$\frac{16.8}{20}$$

ft B0 M1

A1ft

$$\frac{17}{20} \text{ selected and } \frac{16.8}{20}$$

QWC – Strand (iii) – Writing both as a fraction with 20 as
 denominator and correct decision for their working

Q1**[4]**

Q15.

(a) **Alternative method 1**

$$4.5 \times 1.1(0)$$

oe

M1

$$4.5(0) \text{ and } 0.45$$

$$\text{or } 450 \text{ and } 45$$

$$\text{or } 495$$

oe

M1dep

$$4.95$$

A1

Alternative method 2

$$4.5 \times 1.1(0) \quad \text{oe}$$

M1

$$4.4(0) \text{ and } 0.55$$

$$\text{or } 440 \text{ and } 55$$

$$\text{or } 495 \quad \text{oe}$$

M1dep

$$4.95$$

A1

(b) $105 \div 35$

M1

$$3$$

A1

[5]

Q16.

(a) **Alternative method 1**

$$3.2 - 1.8 \text{ or } 1.4$$

M1

$$7$$

A1

Alternative method 2

$$3.2 - \text{at least five } 0.2\text{s}$$

$$\text{or } 1.8 + \text{at least five } 0.2\text{s}$$

M1

$$7$$

A1

Alternative method 3

$$3.2 \div 0.2 \text{ or } 16$$

$$\text{and } 1.8 \div 0.2 \text{ or } 9$$

M1

$$7$$

A1

(b) It will take more days

*oe the answer would be higher
eg it will be more than 7*

B1

Additional Guidance

Slower/longer than 7 days

B1

Slower/longer alone

B0

[3]