

8300

GCSE MATHEMATICS

Foundation and Higher tier – Questions by Topic – Mark Scheme

Number

Ordering fractions, decimals and percentages

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.

(a) $-0.3 \frac{1}{3} 3.03 \ 33.3$

$\frac{1}{3} = 0.3(\dots)$
or
B1 for -0.3 first and 33.3 last
or
B1 for reverse order

B2

- (b) No ticked **and** partial explanation eg
No, one is positive, one negative
No, $33.3 + 0.3$
oe
Implied if Q1 awarded

B1

No ticked **and** full explanation eg
No, it is 33.6
No, $33.3 + -0.3 = 33$
Strand (iii)
oe

Q1

[4]

Q2.

Decimals

$$\left(\frac{1}{10}\right) = 0.1 \text{ or } (11\% =) 0.11$$

M1

$$\left(\frac{1}{10}\right) = 0.1 \text{ and } (11\% =) 0.11$$

oe

A1

Converting 1/10 and 11% to decimals with at least one right and arranging in correct ft order for **their** decimals

Strand (ii)

SC1 for $\frac{1}{10}$, 11%, 0.2 with no working

Q1

Alternative Method 1

Percentages

$$\left(\frac{1}{10}\right) = 10(\%) \text{ or } (0.2 =) 20(\%)$$

M1

$$\left(\frac{1}{10}\right) = 10(\%) \text{ and } (0.2 =) 20(\%)$$

oe

A1

Converting 1 / 10 and 0.2 to percentages (both with percentage signs) with at least one right and arranging in correct ft order for **their** percentages

Strand (ii)

SC1 for $\frac{1}{10}$, 11%, 0.2 with no working

Q1

Alternative Method 2

Fractions

$$(0.2 =) \frac{2}{10} \text{ or } (11\% =) \frac{11}{100}$$

oe fraction

M1

$$\frac{10}{100} \text{ and } \frac{20}{100} \text{ and } \frac{11}{100}$$

oe three correct fractions with common denominator

A1

Converting all numbers to fractions with a common denominator with at least one numerator right and arranging in correct ft order for **their** fractions

Strand (ii)

SC1 for $\frac{1}{10}$, 11%, 0.2 with no working

Q1

[3]

Q3.

(a) (0).8(0)

B1

(b) $\frac{7}{10}$

oe eg $\frac{14}{20}, \frac{70}{100}$

B1

(c) (0).75

B1

(d) 0.7, $\frac{3}{4}$, 80(%)

In any format

Allow correct answer or ft from their answers to a,b,c.

B1 ft

[4]

Q4.

(a) 3.6

B1

(b) 0.325 0.5 0.62

B1

(c) $\frac{4}{5}$ and 80%

B1 for one correct (and one incorrect) or for two correct and one incorrect

Any indication

B2

[4]

Q5.

$3 \div 8$ or $\frac{3}{8} \times 100$ or $\frac{38}{100}$ or 38(%) or 37.(5%)

M1

0.37(5)

or $\frac{76}{200}$ and $\frac{75}{200}$

or 37.(5%) and 38(%)

oe

A1

Both numbers in same format and correct conclusion from their values

Strand (ii)

Dependent on M1 and correct method(s) for conversion(s)

SC1 for $\left(\frac{1}{8} = \right) 0.125$

or 12.5%

Q1

[3]

Q6.

0.7 $\frac{3}{4}$ 80%

with no incorrect working seen

oe

B1 at least one correct conversion comparable with another value

SC1 reverse order with no incorrect working seen

B2

Additional Guidance

Condone missing percentage signs, eg allow 70 for 70%

Correct answer with no working shown

B2

Accept equivalent forms to the given numbers on the answer line

eg 70% 75 80%

B2

eg 70 75 80

B2

eg 0.7 $\frac{3}{4}$ $\frac{8}{10}$

B2

eg 7% 75% 80%

B1

For B1, to be comparable, fractions must have the same denominator or numerator

eg $\frac{7.5}{10}$ $\frac{8}{10}$

B1

eg $\frac{3}{4}$ $\frac{8}{10}$ with no further correct work

B0

[2]

Q7.

Alternative method 1

$$\frac{16}{40} \text{ or } \frac{25}{40} \text{ or } \frac{20}{40}$$

M1

Valid comparison

eg $\frac{16}{40}$ and $\frac{25}{40}$ and $\frac{20}{40}$ or $\frac{4}{40}$ and $\frac{5}{40}$ oe

M1

$$\frac{2}{5}$$

Must see working

A1

Alternative method 2

0.4 or 0.625 or 0.5 40(%) or 62.5(%) or 50(%)

M1

0.4 and 0.625 and 0.5
or 0.1 and 0.125. 40(%) and 62.5(%) and 50(%)
or 10(%) and 12.5(%)

M1

$$\frac{2}{5}$$

Must see working

A1

[3]

Q8.

Correct order **and** all four correct values seen in same format

3, 3.15, 3.25, 3.5(0)

or 3, $3\frac{15}{100}$, $3\frac{25}{100}$, $3\frac{50}{100}$

or 3, $3\frac{3}{20}$, $3\frac{1}{4}$, $3\frac{1}{2}$

or 300(%), 315(%), 325(%), 350(%)

or $\sqrt{9}$, 3.15, $\frac{13}{4}$, $3\frac{1}{2}$ after values

seen in same format oe

B2 all four correct values in same format

or three correct values in same format and correct order for their values

B1 three correct values in same format

SC1 $\sqrt{9}$, 3.15, $\frac{13}{4}$, $3\frac{1}{2}$ with no working

B3

[3]

Q9.

(a) 78%

B1

(b) $\frac{1}{3}$

B1

[2]

Q10.

>

B1

=

B1

<

B1

Additional Guidance

Must use the correct symbol, not word equivalents

[3]

Q11.

0.215

B1

[1]

Q12.

$\frac{1}{4}$, $\frac{4}{10}$, 0.404, 44%

with no incorrect conversions

Accept values in any correct format

*B1 two correct conversions to decimals
or two correct conversions to percentages
or two correct fractions with common denominators*

B2

Additional Guidance

Condone missing percentage signs

0.25, 0.4, 0.404, 0.44

B2

25%, 40%, 40.4%, 44%

B2

$\frac{2}{5}$
25%, $\frac{2}{5}$, 0.404, 44% with no other working
(all correct, even though in different formats)

B2

$\frac{1}{4}$, $\frac{4}{10}$, 0.404, 44% with no working

B2

$\frac{1}{4}$, $\frac{4}{10}$, 0.404, 44% with conversions to 25%, 40%, 40.04%
(one incorrect conversion)

B1

25%, 40%, 40.04% (two correct conversions)

B1

44%, 0.404, $\frac{4}{10}$, $\frac{1}{4}$ (in reverse order) with no working for B1

B1

[2]

Q13.

(a) $2.33 < \text{answer} < 2.\dot{3}$ eg 2.331

B1

(b) $\frac{1}{5} < \text{fraction} < \frac{1}{4}$ eg $\frac{21}{100}$, $\frac{9}{40}$

B1

[2]