

8300

GCSE MATHEMATICS

Foundation tier – Questions by Topic – Mark Scheme

Statistics

Calculating the range

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.

12

B1

[1]

Q2.

$n - 1$

B1

[1]

Q3.

Alternative method 1

$$-2\frac{7}{8} + 15\frac{1}{4}$$

oe

or $15\frac{2}{8}$

common denominator for both fractional parts of the mixed numbers

or $(-2.875$ and 15.25

conversion of both numbers to decimals with at least one correct

or $(-)\frac{23}{8}$ and $\frac{61}{4}$

conversion of both numbers to improper fractions with at least one correct

M1

$$-2\frac{7}{8} + 15\frac{2}{8}$$

oe common denominator

or $-2.875 + 15.25$

correct decimals

or $-\frac{23}{8} + \frac{122}{8}$

oe common denominator

M1dep

$$\frac{99}{8} \text{ or } 12\frac{3}{8} \text{ or } 12.375$$

oe fraction, mixed number or decimal

A1

Alternative method 2

$$-2 + 15 \text{ and } (-)\frac{7}{8} + \frac{1}{4}$$

M1

$$-2 + 15 \text{ and } (-)\frac{7}{8} + \frac{2}{8}$$

oe common denominator

or $13 - \frac{5}{8}$

M1dep

$$\frac{99}{8} \text{ or } 12\frac{3}{8} \text{ or } 12.375$$

oe fraction, mixed number or decimal

A1

Additional Guidance

$15\frac{1}{4} - -2\frac{7}{8}$ scores M0, but followed by $15\frac{2}{8} + 2\frac{7}{8}$ scores M1 on Alt 1

Values in 2nd mark must be correct; no ft from incorrect conversion

$\frac{99}{8}$

incorrectly converted to a decimal or mixed number

M1M1A1

$$13\frac{-5}{8}$$

M1M1A0

[3]

Q4.

3

B1 for 8 seen as value of X for Set A

or 3 seen as value of X for set A but different value for set B

B2

[2]

Q5.

7 (kg) 200 (g) + 650

or

7200 + 650 or 7.2(00) + 0.65(0)

or

7850 seen or 7.85(0) seen

or

850 seen or 0.85(0) seen

M1

7 kilograms 850 grams

SC2 7.85(0) kilograms 7850 grams

A1

Additional Guidance

850 may be seen embedded eg Answer 29.75 kilograms 850 grams

M1A0

7 kg 850 g seen in working but different answer

M1A0

7.2 + 650 with no other creditworthy work

M0A0

[2]

Q6.

Alternative method 1

0.03×200 or 6

or

0.035×200 or 7

or

0.015×200 or 3

or

0.01×200 or 2

M1

0.035×200 or 7

and

0.01×200 or 2

M1dep

5

A1

Alternative method 2

$0.035 - 0.01$ or 0.025

M1

their 0.025×200

M1dep

5

A1

Additional Guidance

Condone errors in calculating 6 or 3 as only the values 7 and 2 are required to correctly answer the question

e.g. 5, 7, 3, 2 the range is $7 - 2 = 5$

M1M1A1

5 on answer line does not imply full marks, method must be checked

e.g. $0.03 \times 200 = 8 \quad 8 - 3 = 5$

M1M0A0

[3]

Q7.

- (a) Subtracting two amounts with one correct

$$124 - 79.5$$

or

124 and 79.5 chosen

$$79.5 + 44.5 = 124$$

M1

$$44.50$$

Condone 44.5

A1

- (b) $124 + 79.5(0) + 122.5(0) + 96 + 85$ or 507

Allow one error or omission

M1

their total $\div 2$

Condone bracket error ie

$$124 + 79.5(0) + 122.5(0) + 96 + 85 \div 2 \text{ or } 464.5(0) \text{ for M2}$$

M1

$$253.50$$

Strand (i) Correct notation

253.5 is M2Q0

SC2 760.50

SC1 760.5

Q1

Alternative method

At least **two** of these divisions

$$124 \div 2$$

or 62

$$79.5(0) \div 2$$

or 39.75

$$122.5(0) \div 2$$

or 61.25

$$96 \div 2$$

or 48

$$85 \div 2$$

or 42.5(0)

M1

their 62 + their 39.75 + their 61.25 + their 48 + their 42.50

Allow one omission

M1

$$253.50$$

Strand (i) Correct notation

253.5 is M2Q0

SC2 760.50

SC1 760.5

Q1

Additional Guidance

If they do further division, mark the **whole** method eg $507 \div 2 \div 2$ M1M0

[5]

Q8.

Selects 1 000 000 or 1×10^6
or 5×10^3 or 5000

B1

Subtracts two values from list oe
 $1\,000\,000 - 5 \times 10^3$

Condone incorrect conversion to or from standard form for this mark

M1

995 000

May be implied

A1

9.95×10^5

*Strand (i)
ft any answer correctly converted to standard form*

Q1ft

[4]