

8300

GCSE MATHEMATICS

Foundation and Higher tier – Questions by Topic – Mark Scheme

Number

Finding percentages of amounts without a calculator

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.

Complete, correct build up method
or 0.51×400 *eg* $400 \div 2 + 400 \div 100$ *oe*

204

M1

A1

[2]

Q2.

0.8×300 *oe*
eg Complete build-up

240

SC1 Answer 60

M1

A1

[2]

Q3.

(a) 60

(b) 39 *Condone %*

B1

B1

[2]

Q4.

Method for finding 1% or a multiple of 5%
or
 1200×35 or 42 000
or
0.35

may be implied by a correct value

M1

Fully correct method that would lead to the correct answer

M1dep

420

SC2 780

SC1 digits 42

A1

Additional Guidance

Values or methods assigned to a percentage must be correct

Ignore a % sign after answer

[3]

Q5.

(a) 35

(b) $920 \div 100 \div 2$

oe $9.2 \div 2$ 920×0.005

4.6

B1

M1

A1

[3]

Q6.

54

B1

[1]

Q7.

(a) 0.6×35

oe or build up method

M1

21

SC1 14

A1

(b) $150 \div 5 \times 4$

Oe

Or 30 seen

M1

120

A1

[4]

Q8.

$14\,000 \times 0.2$

or

$14\,000 \div 10 \times 2$

or

$(10\% =) 1400$

or

$(1\% =) 140$

oe

eg $14\,000 \div 5$

20

100 $\times 14\,000$

M1

2800

oe eg 2800.00

A1

Additional Guidance

2800 followed by $14\,000 - 2800$ (implied by 11 200)

M1A0

$14\,000 \div 10 = 4000$ followed by $4000 \times 2 = 6000$ (fully correct method)

M1A0

$14\,000 \div 10 = 4000$ followed by $20\% = 8000$ (method not shown for 20% but it is correct for $2 \times$ their 10%)

M1A0

$14\,000 \div 10 = 4000$ followed by $20\% = 6000$ (method not shown for 20%)

M0A0

$10\% = 140$, $140 \times 2 = 280$ (method not shown for 10%)

M0A0

$14 \div 5$ or 2.8 (without place value adjustment)

M0A0

[2]

Q9.

Alternative method 1

$300 \div 10$ or 30 oe

M1

their 30×6.5

or their $30 \times 6 + \text{their } 30 \div 2$

or $300 - \text{their } 30 \times 3.5$

or

$300 - (\text{their } 30 \times 3 + \text{their } 30 \div 2)$

oe

M1dep

195

SC2 105

A1

Alternative method 2

$300 \div 100$ or 3 oe

M1

their 3×65 or $300 - \text{their } 3 \times 35$

oe

M1dep

195

SC2 105

A1

Alternative method 3

Correct method to work out any multiple of 5% of 300 up to 95%

e.g. $50\% = 300 \div 2$

M1

Fully correct build-up method to work out 65% of 300

e.g. $300 \div 2 + 3 \times 300 \div 20$

or $150 + 3 \times 15$

(no errors seen)

M1dep

195

SC2 105

A1

Alternative method 4

$65 \div 100$ or 0.65 or 65×300

or 19 500

M1

$300 \times \frac{65}{100}$ or $300 \times \text{their } 0.65$

or their $19\,500 \div 100$ oe

M1dep

195

SC2 105

A1

Additional Guidance

In Alt 3, either a correct method or a correct value must be seen for the first M1

Note that $300 \times 50\%$ is not allowed as a correct method

If Alt 3 is to be used, the percentage that is attempted must be stated e.g. $20\% = 300 \div 5$

Do not ignore further working for the A mark

e.g. $300 - 195$

M1M1A0

[3]

Q10.

$$\frac{110}{100} \times 80$$

or

(10% =) 8

oe eg $80 + \frac{1}{10} \times 80$ or $80 + 8$
or 8×11 or 110×0.8 or 1.1×80
or 72 (implies 8)

88

M1

A1

Additional Guidance

88% as answer

M1A0

[2]

Q11.

- (a) Ticks 'No' and gives correct explanation indicating her error

*eg It should be 0.03
0.3 would give 30%
It's 10 times too big
You need to divide by 10 as well*

B1

Additional Guidance

'Yes' ticked

B0

If 'No' is not ticked, explanation must include a decision that the statement is incorrect
'No' not ticked and 'it should be 0.03' (only implies 'No')

B0

'No' not ticked and 'it should be 0.03 so she is wrong'

B1

It is not sufficient to only show a different correct method,
eg 'No' and 'divide by 100 and multiply by 3'

B0

eg 'No' and 'she has divided by 10 and multiplied by 3 but she should have divided by 100 then multiplied by 3'

B1

'No' and '1700 × 0.03' (a correction of Laura's method)

B1

Calculating the correct answer must come with the correct evaluation of Laura's method
eg 'No' and 'should be 51'

B0

eg 'No' and 'Laura gets 510 but it should be 51'

B1

- (b) Ticks 'No' and gives correct explanation

*Eg $\frac{30}{29}$ is bigger than 1
58 is from $\frac{30}{29}$ the answer would have to be bigger than 60 it will be a decimal*

B1

Additional Guidance

'Yes' ticked

B0

'60 doesn't divide by 29' oe

B0

'No' ticked and 'the numerator and denominator are wrong way round'

B1

If 'No' is not ticked, explanation must include a decision that the statement is incorrect
'No' not ticked and 'it should be more than 60' (only implies 'No')

B0

'No' not ticked and 'it should be more than 60 so she is wrong'

B1

'No' ticked and $60 \div 29 = 2.(...)$ then $2.(...) \times 30 = [60, 70)$
accept 2 r2 for 2.(...)

B1

'No' ticked and $30 \div 29 = 1.(...)$ and $1.(...) \times 60 = [60, 70)$
accept 1 r1 for 1.(...)

B1

'No' ticked and 'because it's a top heavy fraction'

B0

'No' ticked and 'because it's a top heavy fraction so it's bigger than 1'

B1

'No' ticked and $'1\frac{1}{29} \times 60'$

B0

'No' ticked and $'1\frac{1}{29} \times 60'$ so the answer is over 60'

B1

[2]

Q12.

$$1.5 \times 36$$

or

$$36 + 36 \div 2$$

54

M1

A1

[2]

Q13.

$$\frac{50}{100} \times 14 \text{ or } 7$$

oe eg 14 \div 2

M1

$$14 - 5 + 1 \text{ or } 10$$

or

$$\text{their } 7 - 5 + 1 \text{ or } 3$$

M1

oe

*their 7 must be an integer,
where $4 < \text{their } 7 < 14$
3 implies M1M1*

$$\frac{3}{10}$$

or

$$3 : 7$$

oe

A1

30

ft their $\frac{3}{10}$ correctly converted to a percentage

B1ft

Additional Guidance

For the B1ft, their percentage must be correct to 2sf or better
30 on the answer line with no incorrect working

M2A1B1

3 in 10 or 3 out of 10

M2A1

3 : 10

M2A0

$7 - 5 = 3 + 1 = 4$, answer 40 (10 implied)

M2A0B1ft

[4]

Q14.**Alternative method 1 - total cost then reduction**

55×6 or 330 oe

M1

their 330 $\div$ 10 or 33 oe

M1dep

their 330 – their 33
or 297

oe dep on M2
 $55 \times 6 \times 0.9$ implies M3

M1dep

2.97 or 297p

condone £2.97p

A1**Alternative method 2 - reduction then total cost**

$55 \div 10$ or 5.5 oe

M1

55 – their 5.5 or 49.5

oe 55×0.9 implies M2

M1dep

their 49.5 $\times$ 6
or
297

oe
dep on M2

M1dep

2.97 or 297p

condone £2.97p

A1**Alternative method 3 - buying 10% fewer bags**

$6 \div 10$ or 0.6

oe

M1

6 – their 0.6 or 5.4

oe 6×0.9 implies M2

M1dep

their 5.4 $\times$ 55
or
297

oe
dep on M2

M1dep

2.97 or 297p

condone £2.97p

A1**Additional Guidance**

Working may be in £ or p or a mixture for up to M3

Ignore units for up to M3

Use the Alt that awards the best mark

Allow a maximum of one error in each build-up method

[4]

Q15.

$$\frac{20}{100} \times 50 \text{ or } 10$$

oe

M1

2

SC1 for 32

A1

[2]

Q16.

$$345 - 96 \text{ or } 249$$

M1

$$80 \div 10 \times 3 \text{ or } 24$$

oe

M1

$$\text{their } 249 \div \text{their } 24$$

or

$$\text{their } 24 \times 10 \text{ or their } 24 \times 11$$

Condone } 345 \div 24

M1

11

A1

[4]

Q17.

$$600 \div 4 (= 150) \text{ oe}$$

M1

$$\frac{40}{100} \times 600 (= 240) \text{ oe}$$

M1

$$\text{their } 150 + \text{their } 240 (= 390)$$

$$600 - \text{their } 150 (= 450) \\ \text{or } 600 - \text{their } 240 (= 360)$$

M1

$$600 - \text{their } 390$$

$$\text{their } 450 - \text{their } 240 \\ \text{or their } 360 - \text{their } 150$$

M1

$$210$$

A1

Alternative method 1

$$25(\%)$$

$$0.25$$

M1

$$\text{their } 25(\%) + 40(\%) (= 65(\%))$$

$$\text{their } 0.25 + 0.4(0) (= 0.65)$$

M1

$$100(\%) - \text{their } 65(\%) (= 35(\%))$$

$$1 - \text{their } 0.65 (= 0.35)$$

M1

$$\frac{\text{their } 35(\%)}{100} \times 600 \text{ oe} \\ 0.35 \times 600$$

M1

$$210$$

A1

Alternative method 2

$$\frac{2}{5} \text{ or } \frac{40}{100} \text{ oe}$$

M1

$$\text{their } \frac{5}{20} + \text{their } \frac{8}{20} \text{ oe}$$

makes common denominators with at least 1 correct numerator

M1

$$1 - (\text{their } \frac{5}{20} + \text{their } \frac{8}{20}) = (\frac{7}{20})$$

M1 dep

$$\text{their } \frac{7}{20} \times 600 \text{ oe}$$

M1

$$210$$

A1

[5]

Q18.

30×80 or 30×0.8 or 2400 or 24

Ignore units

M1

their $24 \div 10 \times 2$ or 4.8(0) oe

or

correct method to find 20% of their 2400 or 24

their 2400

10 $\times 2$ or 480

$80 \div 10 \times 2 \times 30$ implies M2

or

$80 \div 10 \times 2 \times 30$ or 480

M1

their 2400 – their 480

dep on 2nd M1

or

their 24 – their 4.8(0)

M1dep

£19.20 or 1920p

Strand (i) correct money notation

Do not accept 19.20 or £19.20p or £19.2

ft only with answer as a multiple of 10p

ft is not allowed with M3 awarded

Q1ft

Alternative Method

80

80×0.2 or 10 $\times 2$ or 16 oe

Correct method to find 20% of 80

M1

80 – their 16 or 64

Ignore units

M1

their 64×30

dep on 2nd M1

M1dep

£19.20 or 1920p

Strand (i) correct money notation

Do not accept 19.20 or £19.20p or £19.2

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Q1ft

[4]

Q19.

6.5 or 3.25 seen

M1

9.75 or 6.5 + 3.25

or 65 – (6.5 + their 3.25)

or 65 – (their 6.5 + 3.25)

M1dep

55.25

A1

Alternative method 1

0.15×65 oe

M1

9.75

or 65 – their (0.15×65) oe

M1dep

55.25

A1

Alternative method 2

0.85 oe

M1

0.85×65 oe

M1dep

55.25

A1

[3]

Q20.

Alternative method 1

4000×250 or 1 000 000

M1

4000×0.2 or 800 or 1.2 seen oe

M1

4000×1.2 or 4800

M1

their 4800×200 or 960 000

dep on second and third M

M1dep

1 000 000

and 960 000

and decrease

A1

Alternative method 2

$1 - 0.2$ or 0.8

M1

$1 + 0.2$ or 1.2

M1

0.8×1.2

dep on M2

M1dep

0.96

A1

0.96 and decrease

A1

[5]

Q21.

$$\frac{170}{100} \times 20 \text{ or } \frac{170}{10} \times 2 \text{ or } 17 \times 2 \text{ or } 34$$

or

$$\frac{170}{100} \times 80 \text{ or } \frac{170}{10} \times 8$$

oe

(Tablet World)

M1

136

A1

180 ÷ 4 or 45

or

$$180 \times \frac{3}{4}$$

oe

(IT Supplies)

M1

135

A1

138

(PC Heaven)

B1

IT Supplies

Strand (iii)

ft for correct decision based on their values, must have both method marks and a total for PC Heaven

Q1ft

[6]

Q22.

60 seen

B1

$$\text{their } 60 - \frac{20}{100} \times \text{their } 60 \text{ or } 48$$

$$\text{oe eg } \frac{80}{100} \times \text{their } 60$$

M1

Yes and 48 seen

Using 70 and getting 56,

hence 'no' scores M1 A1

56 with no conclusion is M1A0

SC1 for 12 and Yes

A1 ft

[3]

Q23.

$$400 \times 1.07$$

B1

[1]

Q24.

$$250 \times 0.85$$

B1

[1]

Q25.

$$(6800 \div 10) + (6800 \div 100) \times 2$$
$$(= 816)$$

$$680 + 2 \times 68$$
$$6800 \times 0.12$$

M1

6800 + their 816

$$6800 \times 1.12 \text{ gets M2}$$

M1 dep

7616

A1

[3]

Q26.

$$\frac{30}{100} \times 4 \text{ or } 1.2(0) \text{ or } 120$$
$$\frac{70}{100}$$

or $\frac{70}{100}$

oe

M1

4 – their 1.2(0) or 2.8

$$\frac{70}{100} \times 4$$

oe

M1dep

(£) 2.80

*Strand (i) Must have correct units
do not accept 2.80p or 280p or 2.8*

Q1

[3]

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Q1.

Alternative method 1

200×0.17 or 2×17 or 34 or 1.17 seen
oe

234

M1

A1

Alternative method 2

$200 \div 10 + 200 \div 10 \div 2 + 200 \div 100 \times 2$
oe

234

M1

A1

[2]

Q2.

Alternative method 1

6300×2.58
oe

16254

M1

A1

Alternative method 2

Fully correct build up method
eg $100\% = 6300$
and $50\% = 6300 \div 2$ or 3150
and $1\% = 6300 \div 100$ or 63
and
 $2 \times 6300 + \text{their } 3150 + 8 \times \text{their } 63$

16254

M1

A1

[2]

Q3.

$10\% \text{ of } 20 = 20\% \text{ of } 10$
Any unambiguous indication

B1

[1]

Q4.

17

B1

[1]

Q5.

(a) $0.7 \times 986 (= 690.2)$
oe

M1

690.20(p)

Strand (i)
690.20 seen ignore further working
SC1 295.80
Do not accept 690.2

Q1

- (b) Circles C and E only
B1 both correct and one other
B1 one correct, 0 or 1 wrong

B2

[4]

Q6.

5

B1

[1]

Q7.

Alternative method 1

4200×0.38 or 1596
1.38 seen

M1

5796

A1

Alternative method 2

$4200 \div 10 \times 3 + 4200 \div 10 \div 2 + 4200 \div 100 \times 3$
or 1596

M1

5796

A1

Alternative method 3

$4200 \div 10 \times 4 \times 4200 \div 100 \times 2$

M1

or 1596

A1

[2]

Q8.

Alternative method 1

$$7800 \times 1.69$$

oe

13 182

M1

A1

Alternative method 2

Fully correct build up method

eg $100\% = 7800$

and $50\% = 7800 \div 2$ or 3900

and $1\% = 7800 \div 100$ or 78

and

$7800 + \text{their } 3900 + 19 \times \text{their } 78$

13 182

M1

A1

[2]

Q9.

Alternative method 1

$$5400 \times 0.27 \text{ or } 1458$$

1.27 seen

6858

M1

A1

Alternative method 2

$$5400 \div 10 \times 2 + 5400 \div 10 \div 2 + 5400 \div 100 \times 2$$

or 1458

6858

M1

A1

Alternative method 3

$$5400 \div 10 \times 3 - 5400 \div 100 \times 3$$

or 1458

6858

M1

A1

[2]

Q10.

Correct method or evaluation for the 25% or the 15%
 or
 correct multiplier for the increase or the decrease seen
eg 28×0.25 or 7
or 40×0.15 or 6
or
1.25 or 0.85 oe

M1

Correct method or evaluation for either calculation
eg $28 + 28 \times 0.25$ or 35
or 40×0.85 or 34

M1dep

Correct method or evaluation for **both** calculations

M1dep

35 with 34 seen

*oe**eg 28 increased by 25% with 35 and 34 seen***A1****Additional Guidance**

28×1.25 or 35

M1M1

40×0.85 or 34

M1M1

28×1.25 or 35 **and** 40×0.85 or 34

M1M1M1

Build-up methods must be correct or show correct method for each step

eg 1 $10\% = 2.8$, $5\% = 1.4$, $25\% = 7$

M1

eg 2 $10\% = 2.8$, $5\% = 2.8 \div 2 = 1.8$, $25\% = 7.4$ (error in build-up but method shown for that step)

M1

eg 3 $10\% = 2.8$, $5\% = 1.8$, $25\% = 7.4$ (error in build-up and method not shown for that step)

M0

35 and 34 seen and 35 chosen by eg circling

M3A1

For 28×0.25 , do not accept $28 \times 25\%$ unless recovered

[4]

Q11.

100 – 60 or 40
or 40% seen

$$\frac{60}{100} \times 850 \text{ or } 510$$

M1

their 40

$$\frac{100}{100} \times 850 \text{ or } 340$$

850 – their 510 or 340

M1dep

$$\frac{1700}{\text{their } 340}$$

M1dep

5

A1

Alternative Method

100 – 60 or 40
or 40% seen

$$1 - 0.6 \text{ or } 0.4$$

M1

(1700 =) 200%

$$1700 \div 850 \text{ or } 2$$

M1

$$200 \div 40$$

$$\text{their } 2 \div 0.4$$

M1dep

5

A1

Additional Guidance

5 with no working scores full marks

[4]

Q12.

$$2 \times 2.5(0) \text{ or } 5(.00)$$

M1

$$0.3 \times \text{their } 5 \text{ or } 1.5$$

or

$$1 - 0.3 \text{ or } 0.7$$

or

$$100 - 30 \text{ or } 70$$

oe

M1

$$\text{their } 5 - \text{their } 1.5$$

or

$$\text{their } 0.7 \times 5 \text{ or } 3.5$$

oe dep on 2nd M1

M1dep

$$3.50$$

A1

[4]

Q13.

Method to calculate the increase on the salary or the decrease to the bonus

$$\text{eg } 26\,000 \times 0.06 \text{ or } 1560$$

$$\text{or } 4000 \times 0.09 \text{ or } 360$$

or decimal multiplier 1.06 or 0.91

oe fraction

M1

Method to calculate the value of the increased salary or the decreased bonus

$$\text{eg } 26\,000 \times 1.06 \text{ or } 27\,560$$

$$\text{or } 4000 \times 0.91 \text{ or } 3640$$

or

Method to calculate the difference between the increase on the salary and the decrease to the bonus

$$\text{eg their } 1560 - \text{their } 360 \text{ or } 1200$$

$$31\,200 \text{ implies } M2$$

M1dep

Method to calculate the decimal multiplier or percentage of the total annual pay

$$\text{eg } \frac{31\,200}{30\,000}$$

or

$$1.04 \text{ or } 104(\%)$$

oe

or

Method to calculate the decimal multiplier or percentage change in the total annual pay

$$\text{eg } \frac{\text{their } 1560 - \text{their } 360}{26\,000 + 4000}$$

$$\text{or } \frac{1200}{30\,000}$$

or

$$0.04 \text{ or } 4(\%)$$

oe

M1

4(%) increase

A1

Additional Guidance

For first M mark do not accept a misread of increase for decrease eg 1.09

M0

$$26\,000 \times 1.06 = 27\,560 \text{ and } 4000 \times 1.09 = 4360$$

$$27\,560 + 4360 = 31\,920 \text{ and } \frac{31\,200}{30\,000}$$

M1M1M1A0

$$24\,440 + 4360 = 28\,800 \text{ and } \frac{28\,800}{30\,000}$$

M0M0M1

$$100 + 6 = 106\%$$

M0

$$26\,000 \times 1.06\%$$

M1M0

[4]

Q14.

3×250 or 750

M1

1470×12 or 17 640

M1

538 000 – 464 500 or 73 500

M1

their $73\,500 \times 0.28$ or 20 580

oe

Dep on 3rd M1

M1dep

their 17 640 + their 20 580 + their 750 or 38 970

Dep on 3rd and 4th M1

Must be adding salary, profit share and bonus

M1dep

38 970 and No

A1

Additional Guidance

For the last method mark, the 3rd and 4th M must have been awarded, but allow the addition of any number of months' salary and any number of £250 bonuses (at least one month of salary and at least one month of bonus)

$1470 + 20\,580 + 250$

M0M0M1 M1depM1depA0

20 580

3rdM1 4thM1dep

Build up method for 28% must be correct or method shown for incorrect parts

eg1 1% of 73 500 = 730, 28% = 20 440 (will also lose the 5th Mdep)

4th M0dep

eg2 1% of 73 500 = $73\,500 \div 100 = 730$, 28% = 20 440

4th M1dep

eg3 10% of 73 500 = 7350, 1% = 73.5, 28% = 2058 (and 5th Mdep0)

4th M0dep

eg4 10% of 73 500 = 7350, 1% = $7350 \div 10 = 73.5$, 28% = $7350 + 7350 + 588 = 15\,288$

4th M1dep

[6]

Q15.

$\frac{5}{100} \times 2500$ or 125

oe

1.05 seen

M1

2500 + their 125 or 2500×1.05 or 2625

oe

M1dep

their $2625 \div 12$ or 218.75

or 220×12 or 2640

M1dep

2625 and 2640 or 218.75 and Yes

A1

[4]

Q16.

Alternative method 1

300×0.19 or 57

oe

300×19 or 5700

M1

$\frac{5}{100} \times$ their 57 or 2.85

or 1.05 seen

oe

$\frac{5}{100} \times$ their 5700 or 285

or 1.05 seen

M1dep

their 57 + their 2.85

or their 57×1.05

their 5700 + their 285

or their 5700×1.05 or 5985

M1dep

59.85

A1

Alternative method 2

$\frac{5}{100} \times 0.19$

or 0.0095

or 1.05 seen

oe

$\frac{5}{100} \times 19$

or 0.95

or 1.05 seen

M1

their $0.0095 + 0.19$

or 1.05×0.19

or 0.1995

oe

their $0.95 + 19$

or 1.05×19

or 19.95

M1dep

their 0.1995×300

their 19.95×300 or 5985

or $1.05 \times 19 \times 3$

M1dep

59.85

A1

Alternative method 3

$$\frac{5}{100} \times 300$$

or 15

or 1.05 seen

oe

M1

their 15 + 300

or 1.05 × 300

or 315

oe

M1dep

their 0.19 × their 315

*19 × their 315 or 5985***M1dep**

59.85

A1**Additional Guidance**

Pick out any correct step, e.g.

$$300 \div 19 \times 1.05$$

M1M1M0A0

$$300 \times 0.5 \times 0.19$$

M1M0M0A0

Beware, 10% of 19 = 1.90, 5% of 19 = 0.95, 1.90 + 0.95 = 2.85 (Alt 2)

M1M0M0A0

If a choice of methods is seen, mark the best

[4]**Q17.****Alternative method 1**

$$100 - 40 - 28 \text{ or } 32$$

M1

$$\text{their } 32 \div 100 \times 275$$

oe

*0.32 × 275 scores M2***M1dep**

88

A1**Alternative method 2**

$$40 \div 100 \times 275 \text{ or } 110$$

or

$$28 \div 100 \times 275 \text{ or } 77$$

oe

M1

$$275 - \text{their } 110 - \text{their } 77$$

M1dep

88

A1**[3]**

Q18.

Alternative method 1

$$\frac{1500}{600} \text{ or } 2.5$$

$$\text{or } \frac{600}{1500} \text{ or } 0.4 \text{ oe}$$

M1

$$3.3 \times 2.5 \text{ or } 8.25$$

$$9.6 \div 2.5 \text{ or } 3.84$$

$$\frac{15}{100} \times 9.6 \text{ or } 1.44$$

$$\text{or } 0.85 \text{ seen}$$

M1

$$\frac{15}{100} \times 9.6 \text{ or } 1.44$$

$$\text{or } 0.85 \text{ seen } \frac{15}{100} \times 3.84$$

$$\text{or } 0.576$$

$$\text{or } 0.85 \text{ seen}$$

$$9.6 - \text{their } 1.44$$

$$\text{or } 0.85 \times 9.6$$

$$\text{or } 8.16$$

M1

$$9.6 - \text{their } 1.44 \text{ or } 8.16$$

$$\text{or } 0.0064 \times 0.85$$

$$3.84 - 0.576$$

$$\text{or } 0.85 \times 3.84$$

$$\text{their } 8.16 \div 2.5$$

M1dep

$$8.25 \text{ and } 8.16$$

$$3.26 \text{ or } 3.264 \text{ or } 3.27$$

A1

1500 g pack identified

Strand(iii) correct conclusion for their values provided method marks have been awarded

Q1ft

Alternative method 2

$3.3 \div 600$ or 0.0055 (price per 1g)
 $3.3 \div 6$ or 0.55 (price per 100g)

M1

$9.6 \div 1500$ or 0.0064
 $9.6 \div 15$ or 0.64
 $9.6 \times \frac{15}{100}$ or 1.44
or 0.85 seen

M1

$\frac{15}{100} \times 0.0064$ or 0.00096

or 0.85 seen

$\frac{15}{100} \times 0.64$ or 0.096

or 0.85 seen

$9.6 - 1.44$

or 0.85×1.44

or 8.16

M1dep

their 0.0064 – their 0.00096

or 0.85×0.0064

or 0.0054(4)

their 0.64 – their 0.096

or $0.85 \times$ their 0.64

or 0.544

$8.16 \div 15$ or 0.544

M1dep

0.0055 and 0.00544

0.55 and 0.544

A1

1500 g pack identified

Strand(iii) correct conclusion for their values provided method marks have been awarded

Q1ft

Alternative method 3

$3.3 \div 600$ or 0.0055 (price per 1 g)

M1

$$\frac{15}{100} \times 9.6 \text{ or } 1.44$$

or 0.85 seen

$$9.6 \div 2.5 \text{ or } 3.84$$

$$\frac{15}{100} \times 9.6 \text{ or } 1.44$$

or 0.85 seen

M1

$9.6 - \text{their } 1.44$

or 0.85×9.6

or 8.16

$$\frac{15}{100} \times 3.84$$

or 0.85 seen

or 0.576

$9.6 - \text{their } 1.44$

or 0.85×9.6

or 8.16

M1

their $8.16 \div 1500$ or 0.00544

$$3.84 - 0.576$$

or 0.85×3.84

their $8.16 \div 2.5$

M1dep

0.0055 and 0.00544

$$3.26 \text{ or } 3.27$$

A1

1500 g pack identified

Strand(iii) correct conclusion for their values provided method marks have been awarded

Q1ft

Alternative method 4

$600 \div 3.3$ or 181.8...

3.30×5 or 16.50

M1

$\frac{15}{100} \times 9.6$ or 1.44

or 0.85 seen

$\frac{15}{100} \times 9.6$ or 1.44

or 0.85 seen

M1

9.6 – their 1.44

or 0.85×9.6

or 8.16

9.6 – their 1.44

or 0.85×9.6

or 8.16

M1

$1500 \div$ their 8.16 or 183.8...

their 8.16 $\times 2$ or 16.32

M1

181.8... and 183.8 ...

16.32 and 1650

A1

1500 g pack identified

Strand(iii) correct conclusion for their values provided method marks have been awarded

Q1ft

[6]

Q19.

$$\frac{6}{100} \times 23.5(0) (= 1.41)$$

oe

M1

their $1.41 + 23.5(0) (= 24.91)$

oe 1.06 \times 23.5(0) M2

M1 dep

their $24.91 \times 4 (= 99.64)$

or

$100 \div \text{their } 24.91 (= 4.(\dots))$

100 \div 4 (= 25)

M1

Yes and 99.64

or

Yes and 4.(...)

Yes and 24.91 (<) 25

A1

Alternative method 1

$4 \times 23.5(0) (= 94)$

M1

$$\frac{6}{100} \times \text{their } 94 (= 5.64) \text{ or } 100 - \text{their } 94 (= 6)$$

oe

M1

their $94 + \text{their } 5.64 (= 99.64)$

or

$\frac{\text{their } 6}{\text{their } 94} \times 100 (= 6.(\dots))$

oe 1.06 \times 94 M3 dep on second M1

M1 dep

Yes and 99.64 or Yes and 6.(...)

A1

Alternative method 2

$100 \div 4 (= 25)$

M1

their $25 - 23.5(0) (= 1.5(0))$

M1

$$\frac{\text{their } 1.5(0)}{23.5(0)} \times 100 (= 6.(\dots))$$

M1

Yes and 6.(...)

A1

[4]

Q20.

$$\frac{20}{100}$$

$$\times 130 \text{ or } 26$$

or 1.2 seen

$$\frac{1}{4}$$

$$\times 195 \text{ or } 48.75$$

$$\frac{3}{4}$$

or seen

$$\text{or } \frac{1}{4} \times 200 \text{ or } 50$$

M1

130 + their 26

$$\text{or } 1.2 \times 130$$

$$\frac{3}{4}$$

$$\times 195$$

or 195 – their 48.75

oe

$$\text{or } \frac{3}{4} \times 200$$

or 200 – their 50

M1dep

130 + their 26

$$\text{or } 1.2 \times 130$$

and

$$\frac{3}{4}$$

$$\times 195$$

or 195 – their 48.75

or 156 or 146.25 or 146

oe

130 + their 26

$$\text{or } 1.2 \times 130$$

and

$$\frac{3}{4}$$

$$\times 200$$

or 200 – their 50

or 156 or 150

M1dep

156 and 146.25

or 156 and 146

156 and 150

A1

Just bykes

Strand (iii)

ft their 156 and their 146.25 or 146 or 150 provided both methods are fully correct

Q1ft

[5]

Q21.

$\frac{20}{100} \times 320$
or $320 \div 5$
or $32 (\times 2)$ seen

oe
or 10% is 32

64

M1

65

A1

B1

$\frac{1}{2}$ of 130 miles

*Strand (iii) Correct conclusion from their answers
ft their 64 and 65
Allow ft only if M1 awarded
oe*

Q1ft

[4]

Q22.

Alternative method 1

80×0.55 or 44
or
 120×0.7 or 84

oe

M1

$80 \times 0.55 + 120 \times 0.7$ or $44 + 84$
or 128

Correct method for both

M1dep

$(80 + 120) \times 0.65$ or 130
or

their $128 \div (80 + 120) \times 100$
or their $128 \div 2$ or 64

65% of total marks available

or

their total score for Riya as a percentage of full marks

M1

128 and 130 and No

oe e.g. No, she needed 130 but was 2 marks short

or

64 and No

oe e.g. 0.64 and 0.65 and No

A1

Alternative method 2 – marks not scored

$$80 \times 0.45 \text{ or } 36$$

or

$$120 \times 0.3 \text{ or } 36$$

oe

M1

$$80 \times 0.45 + 120 \times 0.3 \text{ or } 36 + 36$$

or 72

Correct method for both

M1dep

$$(80 + 120) \times 0.35 \text{ or } 70$$

or

$$\text{their } 72 \div (80 + 120) \times 100$$

or their $72 \div 2$

35% of total marks available

or

their total score for Riya as a percentage of full marks

M1

72 and 70 and No

oe e.g. No, she failed by 2 marks

or

36 and 35 and No

oe e.g. 0.36 and 0.35 and No

A1

Alternative method 3

$$80 \times 0.55 \text{ or } 44$$

oe

M1

$$(80 + 120) \times 0.65 \text{ or } 130$$

65% of total marks available

M1

their 130 – their 44 or 86

and 120×0.7 or 84

or

their 130 – their 44 or 86

and their $86 \div 120 \times 100$ or 71.6...

or 72

dep on M1M1

M1dep

86 and 84 and No

oe e.g. No, she needed 2 more marks on B

or

71.6... or 72 and 70 and No

oe e.g. No, she needed 1.6% more on B

A1

Alternative method 4

$$120 \times 0.7 \text{ or } 84$$

oe

M1

$$(80 + 120) \times 0.65 \text{ or } 130$$

65% of total marks available

M1

their 130 – their 84 or 46

$$\text{and } 80 \times 0.55 \text{ or } 44$$

or

their 130 – their 84 or 46

$$\text{and their } 46 \div 80 \times 100 \text{ or } 57.5$$

dep on M1M1

M1dep

46 and 44 and No

oe e.g. No, she needed 2 more marks on A

or

57.5 and 55 and No

oe e.g. No, she needed 2.5% more on A

A1

Additional Guidance

Build up steps for percentages must be correct or have fully correct method shown for any incorrect steps

eg1 $50\% = 40$, $5\% = 16$, section A = 56

M0

eg2 $50\% = 40$, $5\% = 80 \times 0.05 = 16$, section A = 56

M1

Ignore % signs given with marks e.g. 44%

128 and she needs 2 more marks implies No

M1M1M1A1

$$55 + 70 = 125$$

M0M0

$125 \rightarrow 62.5\%$ and No

M1A0

Allow misread of 55% of 120 and 70% of 80 for method marks

max M3

[4]