

**Pearson Edexcel**  
**Level 1/Level 2 GCSE (9-1)**  
**Mathematics (1MA1)**

**May/June 2022 Exemplar**  
**1MA1-3F Paper 3 (Calculator)**

**Foundation Tier**

Senior Examiner's feedback on student responses

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## About this booklet

This document has been produced to support mathematics teachers delivering the new GCSE (9-1) Mathematics specification.

This document looks at a selection of questions from the June 2022 GCSE (9 - 1) Mathematics Foundation tier examination. It shows real student responses to selected questions and how the examining team follow the mark schemes to demonstrate how the students would be awarded marks on these questions.

Our examining team have selected student responses to Foundation tier questions and common questions that are in both the Higher tier and Foundation tier from the June 2022 examination. Following each question, you will find the mark scheme for that question, examiner comment, data on how the question performed and then a range of student responses with accompanying examiner comments on how the mark scheme has been applied and the marks awarded, and on common errors for this sort of question.

# How to use this booklet

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27 28 29

Navigate to a question

**Question 7**

Question
Mark Scheme
Examiner Comments

Performance
Response A
Response B
Response C

Question 7 - Question

7 Simon buys some candles.  
Each candle costs £2

Simon pays with a £20 note.  
He gets £6 change.

Work out the number of candles Simon buys.

(Total for Question 7 is 3 marks)

Question 7 - Mark Scheme

Question	Answer	Mark	Mark scheme	Additional guidance
7	7	P1	for $20 - 6 (= 14)$ or $20 \div 2 (=10)$ and $6 \div 2 (=3)$	
		P1	for " $14 \div 2 (= 7)$ or " $10 - 3 (= 7)$ "	
		A1	cao	

Navigate to a specific part of this question

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Question: 7 8 11 16 18 20 21 22 25  
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Question 7 - Examiner Comments

Generally well answered, some with minimal working shown. Careless arithmetic was a major reason for some students not gaining full marks in this question.  $20 - 6 = 24$  or  $20 - 6 = 12$  were the most common errors made but by dividing correctly by 2 to get 12 or 6, 2 out of the 3 marks available were possible. A common approach was to list costs of candles in multiples of 2. However, it was not uncommon for some multiples to be omitted, thus affecting the final number of candles bought. Some weaker students got no further than working out the number of candles that could be bought for £20. To gain any credit  $£6 \div 2$  also needed to be seen. Giving an answer of 14 on the answer line was also common following correct calculations, with 7 candles often being an embedded answer.

Question 7 - Performance

Mean score	Max score	Mean %	Edexcel averages: mean scored by candidates achieving grade:						
			ALL	5	4	3	2	1	U
2.70	3	90	2.70	2.97	2.93	2.84	2.64	2.18	1.47

Q7



## General Examiner Feedback

It was pleasantly surprising to find students making improvements in their approaches to questions that required a written response, and in longer multi-step questions. In particular written responses in questions 8, and 14 showed improvements. Multi-step questions 24 and 25, towards the harder end of the paper, were answered quite well and demonstrated a desire of students to pursue the challenge of the paper through to nearly the end. Centres are to be commended for the preparation that must have gone on to ensure students had the confidence in their approach to the paper.

In terms of presentation of their working, students still have some way to go. Of greatest concern is the proportion of work that is spoilt by miscopying of figures, either from the given question, or students who miscopy their own figures in working. This was most prolific in questions 7, 11, 19, 24, 25 and 27 but was also seen in other questions.

There were also occasions where students prematurely rounded or truncated their figures, either their own figures or whilst in the process of taking them from the calculator. This was seen in questions 15, 19, 22, 24, 25, 27 and 29. This type of error prevents the award of any accuracy marks, but allowance can sometimes be given for the award of method or process marks, as long as the question has not been made any easier.

When drawing or measuring diagrams students need to ensure they use a ruler accurately. There were surprising errors shown in questions 6, 13 and 16 where evidence suggests that students either did not have a ruler or were using a ruler incorrectly. There was evidence that students had a calculator for this paper and used it well. However, there were occasions when break-down methods were used in attempts to work out percentages, usually far less successful than a more direct approach using a calculator method.

Within a broad range of questions, the paper was able to discriminate well. Weakest areas continue to be the application of ratios, scales and rates, but also algebraic manipulation and problem solving. Time remains a weakness as in question 27, where many students were treating 40 minutes as 0.4 or 0.6 for the purposes of calculation. Strengths included knowledge of basic probability, number sequences, averages, and working with questions related to real life problems.

Questions which had a slightly unexpected approach, that is required more thought, caused immediate problems for some, even in the earlier part of the paper. This includes questions 6, 12 and 13. Question 27 to 30 were the more challenging questions for those striving to demonstrate ability at the highest grades available, and a significant proportion of students therefore failed to score on these questions, but this did not stop them from having a go.

The inclusion of working out to support answers remains an issue for many; but not only does working out need to be shown, it needs to be shown legibly, demonstrating the processes of calculation that are used. This is most important in longer questions, and in “show that” questions. Examiners reported some difficulty in occasionally interpreting complex responses, poorly laid out, in questions 19, 24, 25 and particularly in questions 27 and 28. Contradictory work was also seen in question 20.

Question:

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## Question 11

 Question

 Mark Scheme

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 Response A

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 Response C

### Question 11 - Question

11 Sinita wants to make 35 picture frames.  
She needs 4 nails for each frame.

Sinita has 3 boxes of nails.  
There are 48 nails in each box.

Has Sinita got enough nails to make all 35 frames?  
Show how you get your answer.

(Total for Question 11 is 3 marks)

### Question 11 - Mark Scheme

Question	Answer	Mark	Mark scheme	Additional guidance
11	Yes (supported)	M1	for $48 \times 3 (=144)$ or $35 \times 4 (= 140)$ or $48 \div 4 (=12)$	
		M1	for $48 \times 3 (=144)$ <b>and</b> $35 \times 4 (= 140)$ or “140” $\div 48 (=2.9\dots)$ or “140” $\div 3 (=46.6\dots)$ or “12” $\times 3 (=36)$ or “144” $\div 4 (=36)$ or “144” $\div 35 (=4.1\dots)$	
		C1	for Yes with 144 <b>and</b> 140 <b>OR</b> 36 <b>OR</b> 2.9... <b>OR</b> 4 (spare) <b>OR</b> 4.1... (each frame) <b>OR</b> 46.6... (in each box)	

Question:

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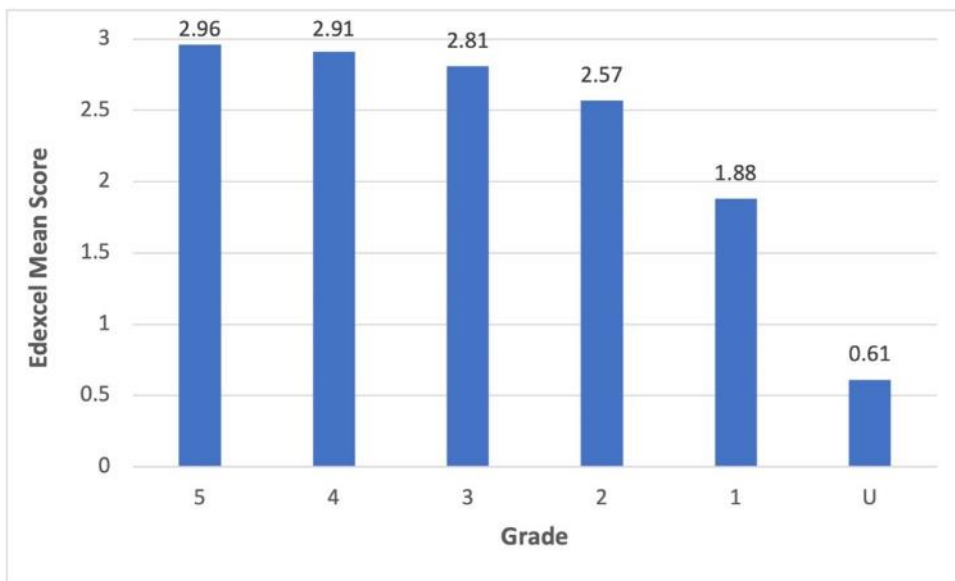
 **Question 11 - Examiner Comments**

This question was answered well by most students. A few students did not give a final conclusion and therefore could not achieve full marks. The most common approach was to multiply to find the number of nails needed and the number of nails they had. Other preferred methods included working out how many nails they had and divide by 4 to find the number of frames that could be made. A small number of students misunderstood what their values represented and therefore said she didn't have enough and needed 4 more nails instead.

Students need to ensure they use their calculator to check their final values as some showed a correct method, but their multiplication skills meant their values were not correct to get full marks.

 **Question 11 - Performance**

Mean score	Max score	Mean %	Edexcel averages: mean scored by candidates achieving grade:						
			ALL	5	4	3	2	1	U
2.63	3	88	2.63	2.96	2.91	2.81	2.57	1.88	0.61



Q11

Navigation icons: ? (Question), ✓ (Check), Menu, Bar chart, Pencil (Write), A, B, C (Options).

Question:

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 **Question 11 - Response A**

11 Sinita wants to make 35 picture frames.  
She needs 4 nails for each frame.

Sinita has 3 boxes of nails.  
There are 48 nails in each box.

Has Sinita got enough nails to make all 35 frames?  
Show how you get your answer.

4 nails each                       $48 \times 3 = 144$   
35 frames  
48 nails per box                 $144 \div 35 = 4.11$   
3 boxes

If  $144 \div 35 = 4.11$

~~###~~


That means sinita will have enough nails  
to make 35 picture frames.


**3 / 3**


M1 M1 C1


An example of a fully correct response where the candidate finds if they have enough nails for each picture frame. Although it doesn't say 'Yes', this is implied by the statement.


Q11











A

B

C

- Question:
- 11
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 Question 11 - Response B

11 Sinita wants to make 35 picture frames.  
She needs 4 nails for each frame.

$$35 \times 4 = 140$$
$$3 \times 48 = 144$$

Sinita has 3 boxes of nails.  
There are 48 nails in each box.

Has Sinita got enough nails to make all 35 frames?  
Show how you get your answer.

$35 \times 4 = 140$   
 $3 \times 48 = 144$   
sinita is missing  
4 nails.

2 / 3

M1 M1 C0

The candidate has correctly worked out the number of nails needed (140) and the number of nails Sinita has (144). They have made an incorrect decision in saying that Sinita is **missing** 4 nails.

Q11

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- 
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- 
- 
- A
- B
- C



Question:

11

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## Question 11 - Response C

- 11 Sinita wants to make 35 picture frames.  
She needs 4 nails for each frame.

Sinita has 3 boxes of nails.  
There are 48 nails in each box.

Has Sinita got enough nails to make all 35 frames?  
Show how you get your answer.

$$\frac{48}{3} = 16 \times 4 = 64$$

*yes she does*

**M0 M0 C0**

The candidate has divided 48 by 3 instead of multiplying.

**0 / 3**

Q11

?

✓

≡

Bar chart icon

Pencil and paper icon

A

B

C

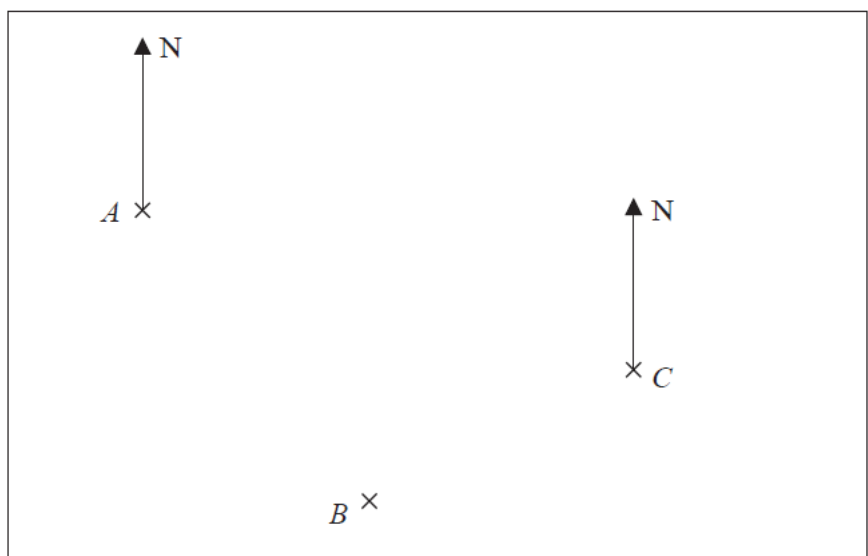
- Question: **11** **13** **14** **19** **20** **24** **25** **26** **28**

### Question 13

Question
Mark Scheme
Examiner Comments
  
Performance
Response A
Response B
Response C

#### Question 13 - Question

13 The accurately drawn map shows the positions of three points, *A*, *B* and *C*, in a field.



Scale: 1 cm represents 150 metres

Parveen walks in a straight line from *A* to *B*.  
She then walks in a straight line from *B* to *C*.

Susan walks in a straight line from *A* to *C*.

Parveen walks more metres than Susan.

(a) How many more?

..... metres  
**(3)**

(b) Find by measurement the bearing of *A* from *C*.

.....°  
**(1)**


**(Total for Question 13 is 4 marks)**

- Question: 11 13 14 19 20 24 25 26 28

 **Question 13 - Mark Scheme**

Question	Answer	Mark	Mark scheme	Additional guidance
13 (a)	300	M1	for a correct method to measure and convert one line to a distance in metres, eg. $(AB =) 5 \times 150 (= 750 \text{ or in the range } 720 \text{ to } 780)$ or $(BC =) 4 \times 150 (= 600 \text{ or in the range } 570 \text{ to } 630)$ or $(AC =) 7 \times 150 (= 1050 \text{ or in the range } 1020 \text{ to } 1080)$	Accept measurements given in mm instead of cm for the first mark. Accept measurements given to a tolerance of $\pm 2\text{mm}$
		M1	or for $5 + 4 - 7 (= 2 \text{ or in the range } 1.4 \text{ to } 2.6)$ for a complete method, eg. “750” + “600” – “1050” or “2” $\times 150$	Where “750”, “600”, “1050” and “2” have come from their measurements
		A1	for answer in the range 210 to 390	
(b)	288	B1	for answer in the range 286 to 290	

Q13

  
  
  
  
  
**A**  
**B**  
**C**

 **Question 13 - Examiner Comments**

Part (a) was well attempted by most students who were able to measure accurately and convert to metres. It was pleasing to see that most showed the calculations required for the conversion. The majority of these went on to gain full marks correctly, adding the appropriate two distances and subtracting the other to find the difference in the overall total. There were a few who used their measurements to calculate the difference of 2 and then multiply by 150 which is a very efficient method. Those that did not measure accurately often went on to gain one mark for showing clear working for conversion and then the difference between the distances, but it was disappointing to find students using measurements that were more than  $\frac{1}{2}$  cm different to the diagram, leading to the suspicion that they either did not have a ruler, or did not know how to use it accurately.

In part (b) the vast majority were unable to tackle this bearings question. Of those who did attempt this question it was common to see the bearing of C from A given. There were very few correct answers in the range with quite a few answers of 285 seen, which was just out of range.

Question:

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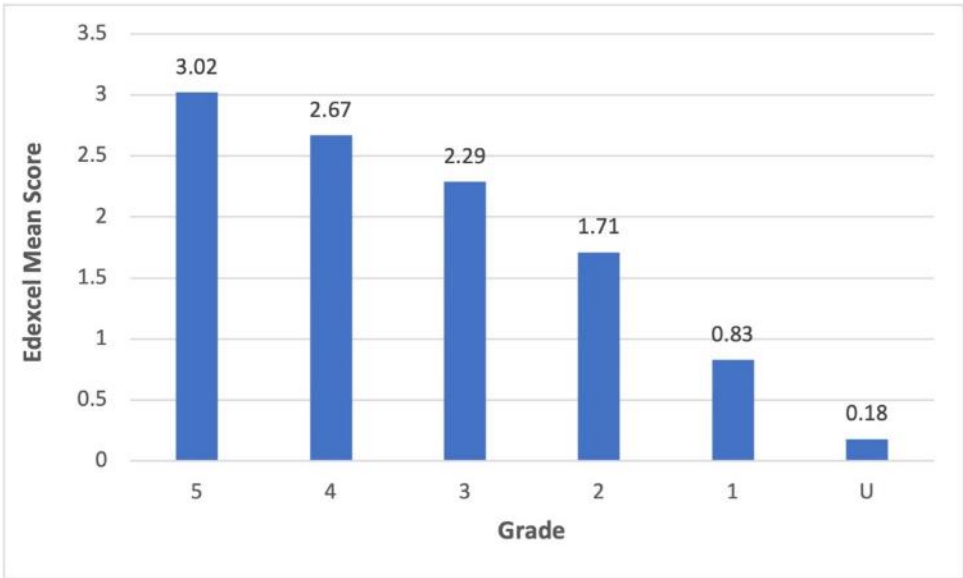
25

26






28

 **Question 13 - Performance**

Mean score	Max score	Mean %	Edexcel averages: mean scored by candidates achieving grade:						
			ALL	5	4	3	2	1	U
2.12	4	53	2.12	3.02	2.67	2.29	1.71	0.83	0.18

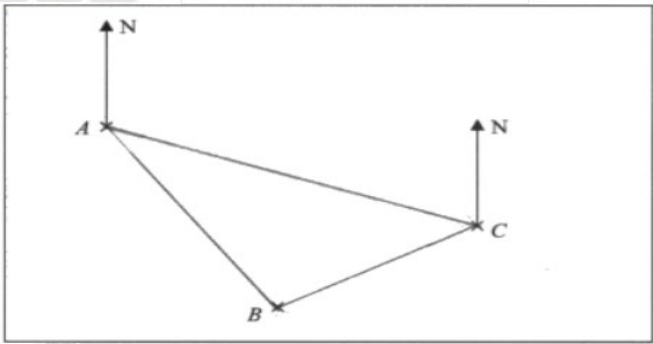


Q13






  
 A  
 B  
 C

- Question: 11 13 14 19 20 24 25 26 28

**Question 13 - Response A**



Scale: 1 cm represents 150 metres

Parveen walks in a straight line from A to B.  
 She then walks in a straight line from B to C.  
 Susan walks in a straight line from A to C.  
 Parveen walks more metres than Susan.

(a) How many more?

$Parveen = 9cm \rightarrow \begin{matrix} 1:150 \\ \times 9 \downarrow \\ 9:1350 \end{matrix} \rightarrow 1350m$   
 $Susan = 7cm \rightarrow \begin{matrix} 1:150 \\ \times 7 \downarrow \\ 7:1050 \end{matrix} \rightarrow 1050m$   
 $1350 - 1050 = 300m$

300 metres (3)

(b) Find by measurement the bearing of A from C.

$360 - 74 = 286$

~~374~~ 286 °

4 / 4

Q13

?

✓

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A

B

C

**Part (a) - M1 M1 A1**

**M1** 5 x 150 OR 4 x 150 (implied by 9 x 150) OR 7 x 150

**M1** complete method for "750" + "600" - "1050"

**A1** correct answer in the range 210 to 390

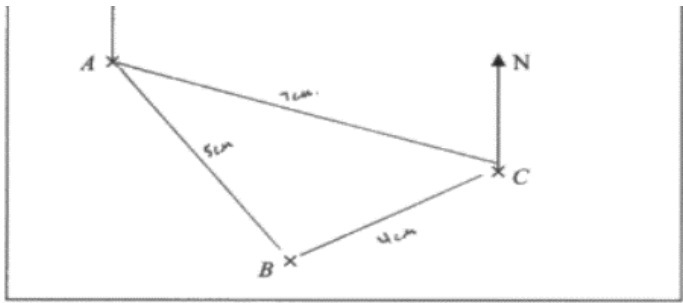
**Note:** an answer of 300 MUST come from a complete correct method. It is possible to get 300 from 1050-750 which is incomplete which is awarded M1M0A0.

**Part (b) - B1**

**B1** answer in the range 286 to 290 .

- Question: 11 13 14 19 20 24 25 26 28

**Question 13 - Response B**



Scale: 1 cm represents 150 metres

Parveen walks in a straight line from A to B.  
She then walks in a straight line from B to C.

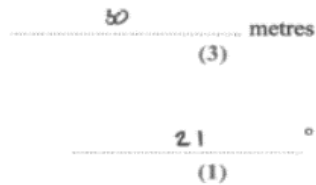
Susan walks in a straight line from A to C.

Parveen walks more metres than Susan.

(a) How many more?

$$\begin{aligned}
 \text{Parveen} &= 5 \times 150 = 750\text{m} & 750 + 600 &= 1350 \\
 \text{Parveen} &= 4 \times 150 = 600\text{m} & & \\
 \text{Susan} &= 7 \times 150 = 1050\text{m} & 1350 - 1050 &= 300\text{m}
 \end{aligned}$$

(b) Find by measurement the bearing of A from C.



2 / 4

Q13

?

✓

—

A

B

C

**Part (a) - M1 M1 A0**

**M1** for 5 x 150 OR 4 x 150 OR 7 x 150

**M1** for "750" + "600" - "1050"

**A0** not in the range 210 to 390

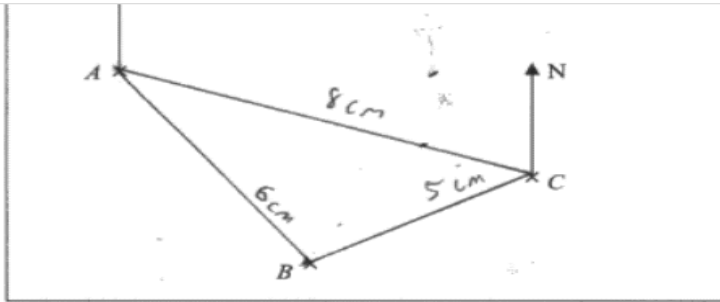
Note an acceptable answer of 300 is shown in working but then changed to 30 on the answer line. Some candidates change their answer by a factor of 10 because they are confused about units. We have to accept the answer they give us on the answer line for the A mark.

**Part (b) – B0**

**B0** not in the range 286 to 290

- Question: 11 13 14 19 20 24 25 26 28

**Question 13 - Response C**



Scale: 1 cm represents 150 metres

Parveen walks in a straight line from A to B. She then walks in a straight line from B to C.

Susan walks in a straight line from A to C.

Parveen walks more metres than Susan.

(a) How many more?

$$\begin{array}{r} 6\text{cm} = 900\text{m} + \\ 5\text{cm} = 750 \\ \hline 1650\text{m} \end{array}$$

$$8\text{cm} = 1200$$

$$\begin{array}{r} 1650 \\ 1200 \\ \hline 450\text{m} \end{array}$$

(b) Find by measurement the bearing of A from C.

$$\begin{array}{r} 410^\circ \\ 180 \\ \hline 287 \end{array}$$

$$\begin{array}{r} 180 \\ 10 \\ \hline 198 \end{array}$$

$$\begin{array}{r} 450 \text{ metres} \\ (3) \\ 198^\circ \\ 287 \\ \hline (1) \end{array}$$

(Total for Question 13 is 4 marks)

1 / 4

Q13

?

✓

≡

A

B

C

**Part (a) – M0 M1 A0**

**M0** incorrect measurements x 150 (note the 5cm is in the wrong place – should be AB)

**M1** complete method "750" + "600" - "1050" using their measurements x 150 (see additional guidance)

**A0** not in the range 210 to 390

**Part (b) – B0**

**B0** not in the range 286 to 290

Question:

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### Question 14

 Question

 Mark Scheme

 Examiner Comments

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 Response B

 Response C

### Question 14 - Question

14 Here is the shoe size of each of 12 boys in a class.

4 5 6 6 6 7 7 8 8 8 8 9

(a) Find the median.

.....  
(1)

(b) Work out the range.

.....  
(1)

For the shoe sizes of each of 12 girls in the class,

the median size is 6  
the range is 3

(c) Compare the distribution of the shoe sizes of the boys with the distribution of the shoe sizes of the girls.

.....  
.....  
.....  
.....  
.....  
.....  
(2)

**(Total for Question 14 is 4 marks)**

- Question: 11 13 14 19 20 24 25 26 28

 **Question 14 - Mark Scheme**

Question	Answer	Mark	Mark scheme	Additional guidance
14	(a) 7	B1	cao	
	(b) 5	B1	cao	
	(c)	C2 (C1	ft for correct comparison of both medians and ranges, eg. median of boys shoe sizes is greater than the median of the girls shoe sizes and the range of the boys shoe sizes is greater than the range of the girls shoe sizes. ft for a correct comparison of either medians or ranges)	Simply quoting values for median, range is insufficient; they must be compared.

 **Question 14 - Examiner Comments**


Part (a) was well answered. A minority gave the answer 7,7 without realising that only one 7 was required highlighting the misconception for how to calculate the median.


Part (b) was also well answered. Some lost the mark because, although 9 – 4 was seen, it was evaluated incorrectly.


For both parts (a) and (b) some students answered incorrectly, giving values for the mean (6.8) and the mode (8).


In part (c) most students attempted an answer. Marks were credited for comparisons using the words median and range (or the acceptable alternatives) but many students did not know that this was the required approach, instead using the words shoe size, feet or distribution. Some simply described the data, listing it or using ‘whereas’ rather than using a comparison word such as larger, smaller.


Q14











A

B

C

Question:

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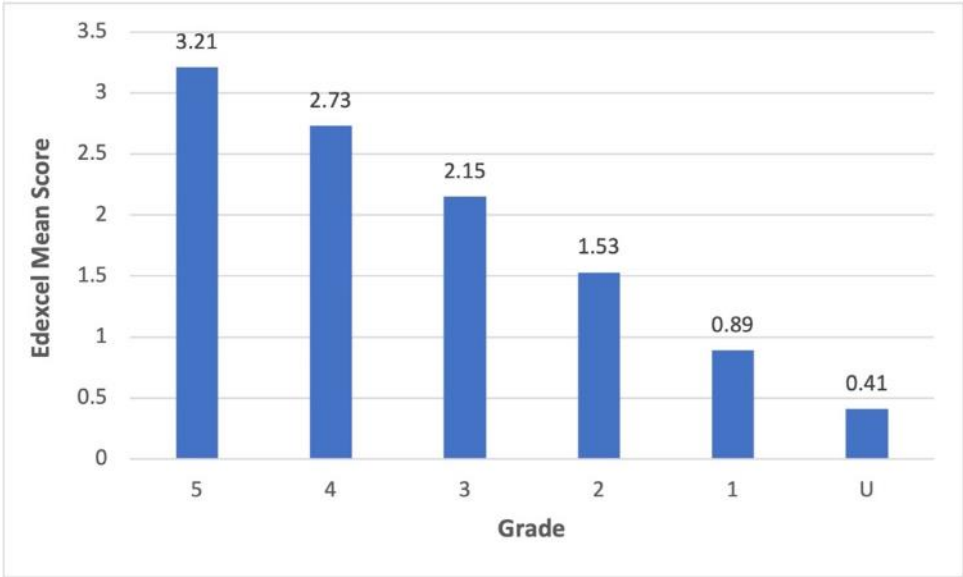
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 **Question 14 - Performance**

Mean score	Max score	Mean %	Edexcel averages: mean scored by candidates achieving grade:						
			ALL	5	4	3	2	1	U
2.10	4	53	2.10	3.21	2.73	2.15	1.53	0.89	0.41



Q14

  
  
  
  
  
A  
B  
C

Question:

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28

**Question 14 - Response A**

14 Here is the shoe size of each of 12 boys in a class.

4 4 4 4 6 7 7 8 8 8 8 9

(a) Find the median.

7  
(1)

(b) Work out the range.

$9 - 4 = 5$   
5  
(1)

For the shoe sizes of each of 12 girls in the class,

the median size is 6  
the range is 3

(c) Compare the distribution of the shoe sizes of the boys with the distribution of the shoe sizes of the girls.

The girls has a range of 3 whereas the boys has a range of 5 meaning the girls shoe size is more consistent. The girls had a lower median than the boys the girls mostly had the same shoe size.

**4 / 4**

**Part (a) – B1**

B1 correct value.

**Part (b) – B1**

B1 correct value.

**Part (c) – C2**

C2 although initially just the values of the range have been stated it is then followed by the statement "the girls shoe size is more consistent" which implies that the girls range is smaller and is a correct comparison of the ranges. The comment "the girls have a lower median" is a correct comparison of the medians.

**Note:** use of the words "whereas" and "only" do not represent a comparison. For example:

- Boys median is 7 whereas the girls is 6 is C0.
- Boys median is 7 whereas the girls is only 6 is still C0.

We need a clear statement as to which one is more/less than the other.

Q14



A

B

C

- Question: 11 13 14 19 20 24 25 26 28

 **Question 14 - Response B**

14 Here is the shoe size of each of 12 boys in a class.

4 5 6 6 6 7 7 8 8 8 8 9

(a) Find the median.

7  
-----  
(1)

(b) Work out the range.

4  
-----  
(1)

For the shoe sizes of each of 12 girls in the class,  
the median size is 6  
the range is 3

(c) Compare the distribution of the shoe sizes of the boys with the distribution of the shoe sizes of the girls.

The boys have a larger range meaning they have both higher shoe sizes and also lower shoe sizes ~~series~~ sizes ~~but~~ and also the girls have a ~~to~~ lower median by 1 the the boys <sup>(of 1)</sup> both median and range ~~is~~ has a difference

(Total for Question 14 is 4 marks)

3 / 4

Q14











A

B

C

**Part (a) – B1**  
B1 correct value.

**Part (b) – B0**  
B0 incorrect value.

**Part (c) – C2**  
C2 for "boys have a larger range" and "girls have a lower median". We can ignore any reference to figures correct or otherwise when they are making their comparisons.

**Note:** if we see an incorrect response from part (a) and/or (b) and the candidates goes on to make a correct comparison relating to their median or range we can award the mark. For example part (a) if their response is 5 and the candidates response in part (c) is the "the median for the girls is higher than the boys". This would gain C1.

Question:

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 **Question 14 - Response C**

14 Here is the shoe size of each of 12 boys in a class.

4 5 6 6 6 7 7 8 8 8 8 9

(a) Find the median.

7  
(1)

(b) Work out the range.

8  
(1)

For the shoe sizes of each of 12 girls in the class,

the median size is 6


the range is 3


(c) Compare the distribution of the shoe sizes of the boys with the distribution of the shoe sizes of the girls.


The boys have a larger set than the girls the most common for the girls is 3 and 8 for the boys and the median of the girls is 6 and the boys are 7


1 / 4


Q14











A

B

C

Part (a) – B1

B1 correct value.

Part (b) – B0

B0 incorrect value.

Part (c) – C0

C0 although we see a comparison between the boys and the girls shoe size we have to see a direct comparison between the median and the range to award any marks.

Question:

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## Question 19

 Question

 Mark Scheme

 Examiner Comments

 Performance

 Response A

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 Response C

### Question 19 - Question

19 There are 400 counters in a box.  
The counters are red or yellow or green.  
 $\frac{3}{8}$  of the counters are red.  
82 of the counters are yellow.  
What percentage of the counters are green?

.....%

**(Total for Question 19 is 4 marks)**

Question:

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28

 **Question 19 - Mark Scheme**

Question	Answer	Mark	Mark scheme	Additional guidance
19	42	P1	for process to find number of red counters, eg. $400 \div 8 \times 3 (= 150)$ <b>or</b> process to convert both to percentages: $3/8$ as 37.5 and $82/400$ as 20.5 <b>or</b> process to convert both to fractions with common denominator: eg $3/8$ as $75/200$ and $82/400$ as $41/200$ oe	NB could use other decimals eg 0.375, 0.205 or % or fractions
		P1	for process to find number of green counters, eg $400 - "150" - 82 (=168)$  <b>or</b> process to find the percentage of red and yellow counters eg $"37.5" + "20.5" (=58)$ or $( "150" + 82) \div 400 \times 100 (=58)$	
		P1	for complete process to find the percentage of counters that are green, eg $"168" \div 400 \times 100$ or $100 - (37.5 + 20.5)$ or $100 - "58"$	
		A1	cao	


Q19











A

B

C

 **Question 19 - Examiner Comments**

The vast majority of students attempted this question with a fair proportion getting full marks. The majority found 150 for red, thus gaining the first mark. The most common approach was then to subtract this together with 82 from 400 to get 168 green counters and thus scoring two marks. Some just subtracted 82 from 150 getting 68 instead of 168. If they knew how to find the percentage of amount, they rarely made a mistake for the last two marks, so 3 out of 4 marks was rare.

The most common error was to subtract the 82 from 400 as a first step and then try to find  $\frac{3}{8}$  of 318 which resulted in no marks. Another incorrect method seen was converting  $\frac{3}{8}$  to a decimal and then adding it to 82.

It was very rare to see students using the alternative method of converting both  $\frac{3}{8}$  and 82 to percentages.

Some students converted  $\frac{3}{8}$  to 0.375 or 37.5 and then added this to 82 before subtracting. There were a fair number of students who managed to add together 82 and 150 then convert this to a percentage (58%) but this was as far as they got, not realising that this was not the percentage of green counters.

Generally, the major weakness was a failure of students to understand how to convert to a percentage for the final answer, which therefore limited the number of marks to just 2

Question:

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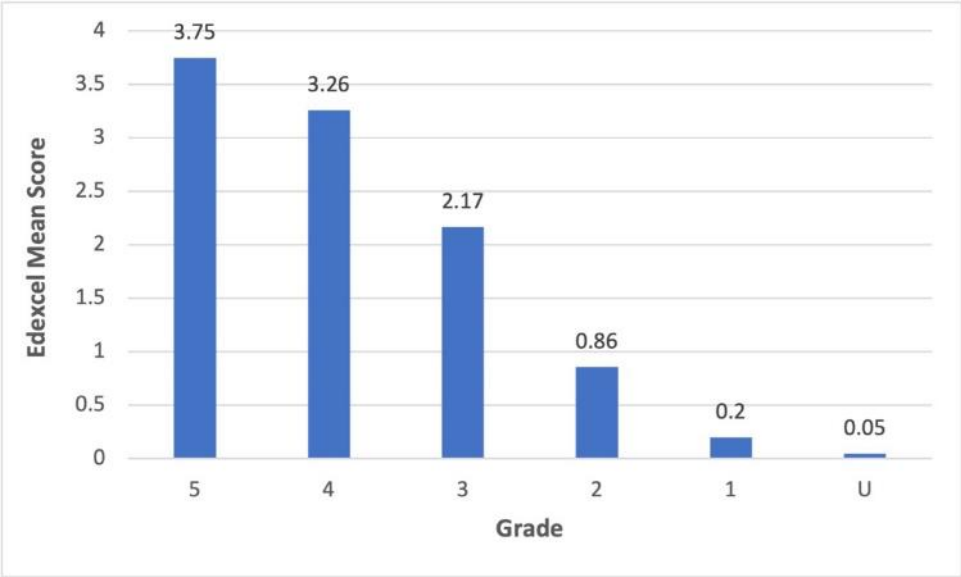
25

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 **Question 19 - Performance**

Mean score	Max score	Mean %	Edexcel averages: mean scored by candidates achieving grade:						
			ALL	5	4	3	2	1	U
2.08	4	52	2.08	3.75	3.26	2.17	0.86	0.20	0.05




Q19











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Question:

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 **Question 19 - Response A**

19 There are 400 counters in a box.  
The counters are red or yellow or green.

$\frac{3}{8}$  of the counters are red. 150

82 of the counters are yellow.

What percentage of the counters are green?

$$400 \div 8 = 50$$

$$50 \times 3 = 150$$

$$150 + 82 = 232$$

$$400 - 232 = 168$$

$$\frac{168}{400} \times 100 = 42\%$$

red yellow green  
150 : 82 : 168

42 %

(Total for Question 19 is 4 marks)

**4 / 4**

P1 P1 P1 A1

Fully correct solution.

P1 for finding the number of red counters

P1 for finding the number of green counters

P1 for finding the percentage of green counters

A1 correct answer of 42

Q19



A

B

C

Question:

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 **Question 19 - Response B**

19 There are 400 counters in a box.  
The counters are red or yellow or green.

$\frac{3}{8}$  of the counters are red.

82 of the counters are yellow.

What percentage of the counters are green?

$$\begin{aligned} \frac{3}{8} \text{ of } 400 &= 150 = \text{red} \\ &= 82 = \text{yellow} \\ \hline &232 = \text{green} \end{aligned}$$

$$\frac{232}{400} \times 100 = 58$$

.....58.....%

(Total for Question 19 is 4 marks)

**2 / 4**

Q19



A

B

C

P1 P1 P0 A0

P1 for finding the number of red counters  $\frac{3}{8} \times 400$

P1 for finding the percentage of red and yellow counters

No further progress is made.

Note: The incorrect labelling of the 232 can be ignored (it is not the green)

Question:

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 **Question 19 - Response C**

19 There are 400 counters in a box.  
The counters are red or yellow or green.

$\frac{3}{8}$  of the counters are red.

82 of the counters are yellow.

What percentage of the counters are green?

red  $\Rightarrow \frac{3}{8}$  of 400 = 150

yellow  $\Rightarrow$   $\begin{array}{r} 82 + \\ \hline \end{array}$

green  $\Rightarrow$   $\begin{array}{r} 232 \\ \hline \end{array}$   
 $400 - 232 = 168$  green counters

.....%

(Total for Question 19 is 4 marks)

**2 / 4**

P1 P1 P0 A0

P1 for finding the number of red counters

P1 for finding the number of green counters

No further progress is made.

Q19



A

B

C

- Question: 11 13 14 19 20 24 25 26 28

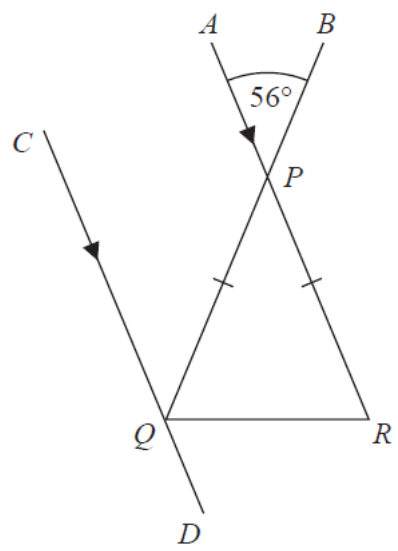
### Question 20

Question
Mark Scheme
Examiner Comments

Performance
Response A
Response B
Response C

**Question 20 - Question**

20 In the diagram,  $PQR$  is an isosceles triangle with  $PQ = PR$ .



$APR$  and  $CQD$  are parallel lines.  
 $BPQ$  is a straight line.  
 Angle  $APB = 56^\circ$   
 Work out the size of angle  $CQR$ .  
 Give a reason for each stage of your working.


(Total for Question 20 is 5 marks)


- Question: 11 13 14 19 20 24 25 26 28


 **Question 20 - Mark Scheme**


Question	Answer	Mark	Mark scheme	Additional guidance
20	118 with reasons	M1	for angle $QPR = 56$ or $CQP = 56$	<p>Angles must be clearly labelled on the diagram or otherwise identified. Full solution must be seen.</p> <p>Correct method can be implied from angles on the diagram if no ambiguity or contradiction.</p> <p>When reasons are given the key words underlined must be present. Reasons need to be linked to their method; any reasons not linked, do not credit. There should be no incorrect reasons given.</p>
		M1	for angle $PQR = (180 - 56) \div 2 (= 62)$	
		C1	(dep on a previous M1) for giving a reason relating to parallel lines: angle $CQR = 180 - "62"$ ( <u>Allied angles</u> / <u>Co-interior angles</u> add up to 180) <b>or</b> angle $CQP = 56$ ( <u>corresponding angles</u> are equal) <b>or</b> use "angle $QPR$ " ( <u>alternate angles</u> are equal)	
		C1	(dep on a previous M1) for at least one reason given from: vertically <u>opposite angles</u> are equal OR <u>vertically opposite angles</u> are equal <b>or</b> base angles of an <u>isosceles triangle</u> are equal <b>or</b> <u>Angles</u> in a <u>triangle</u> add up to 180	
		A1	for 118	


Q20











A

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C

Question:

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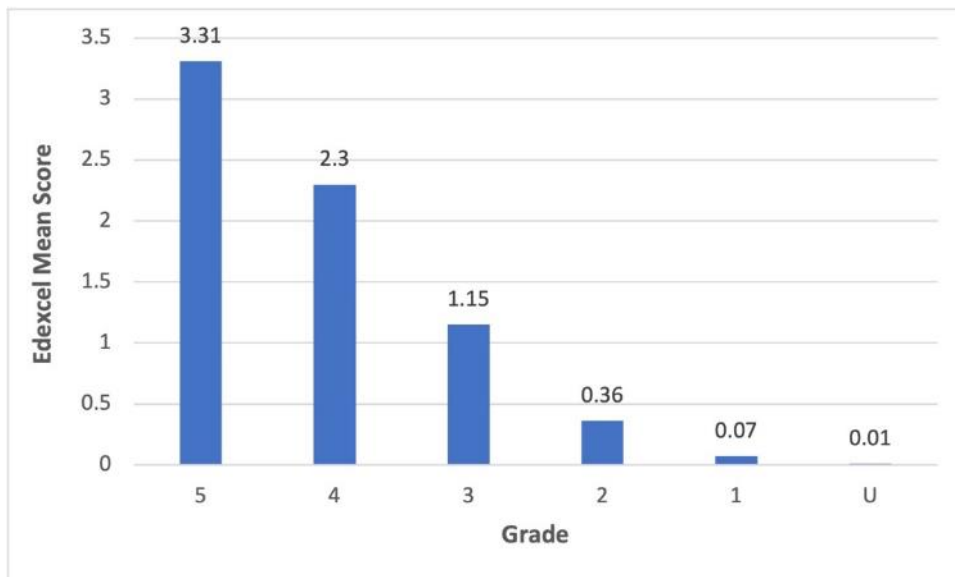
 **Question 20 - Examiner Comments**

Full marks on this question were rare. It was clear that students knew a lot about angle rules and were able to apply some of this knowledge in the question, but unfortunately, they were frequently let down by their understanding of angle notation and their ability to accurately state the angle facts they were using. It was rare to see students using three letter angle notation so working out under the diagram was often likely correct but unable to score marks as it wasn't clear which angle a student was working out. Students who wrote their answers on the diagram tended to fare better. Students underestimated how to explain their reasons for their working out although those giving reasons usually gained one mark for “vertically opposite” or “opposite angles”. However, phrases like "opposite equal" and "triangles add up to 180" were common, missing the key words necessary to gain the communication marks. Reasons using angles on parallel lines were either often not given or were incorrect.

Students who did not use an angle rule relating to parallel lines sometimes did  $180 - 62$  ( $PQR$ ) and then divided their answer by 2 to incorrectly work out  $CQP$ . Others didn't seem to understand which angle was actually  $CQR$ : it was not uncommon to see, using angles about point  $Q$ , the incorrect calculation  $180 - 62 = 118$ .

 **Question 20 - Performance**

Mean score	Max score	Mean %	Edexcel averages: mean scored by candidates achieving grade:						
			ALL	5	4	3	2	1	U
1.40	5	28	1.40	3.31	2.30	1.15	0.36	0.07	0.01



Q20



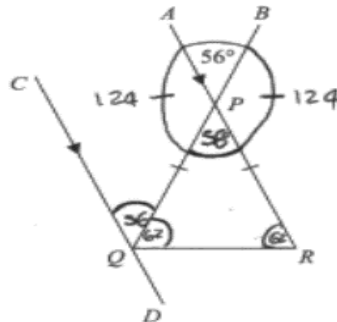
A

B

C

- Question: 11 13 14 19 20 24 25 26 28

Question 20 - Response A



APR and CQD are parallel lines.  
BPQ is a straight line!

Angle APB = 56°

Work out the size of angle CQR.  
Give a reason for each stage of your working.

1.  $56 + 56 = 112$   
because opposite angles are equal

2.  $180 - 56 = 124$   
angles on a straight line  
because a triangle adds to 180°

3.  $124 \div 2 = 62$   
in isosceles triangles, the bottom two angles are always equal

5.  $Q = 56$   $56 + 62 = 118$   
because corresponding angles are equal

4. CQR = straight line  
 $= 180 - 62 = 118$   
because angles on a straight line add up to 180°

6. Therefore, angle CQR adds up to 118° because  $62 + 56 = 118$

(Total for Question 20 is 5 marks)

Q20

Navigation icons: question mark, checkmark, list, bar chart, pencil, and options A, B, C.

5 / 5

M2 C1 C1 A1

A fully correct response.

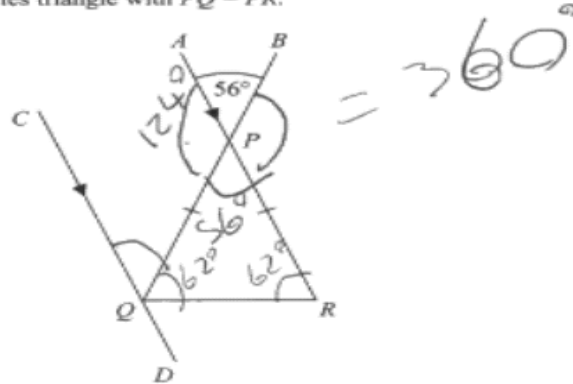
NB. We will condone the use of single letter labelling of angles "Q=56" provided there is no ambiguity or contradiction.

Here the angle is correctly seen on the diagram. Angles must be clearly labelled or otherwise identified to award the method marks without sight of 118

- Question: 11 13 14 19 20 24 25 26 28

Question 20 - Response B

20 In the diagram,  $PQR$  is an isosceles triangle with  $PQ = PR$ .



$APR$  and  $CQD$  are parallel lines.  
 $BPQ$  is a straight line.

Angle  $APB = 56^\circ$

Work out the size of angle  $CQR$ .  
 Give a reason for each stage of your working.

Handwritten working:

$$180 - 56 = \frac{124}{2} = 62$$

$$56 \times 2 = 112$$

$$360 - 112 = \frac{248}{2} = 124$$

$$180 - 124 = 56$$

$$62 + 56 = \underline{\underline{118^\circ}}$$

3 / 5

Q20

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Bar chart icon

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A

B

C

**M2 C0 C0 A1**  
 The correct angles are seen on the diagram for both method marks.

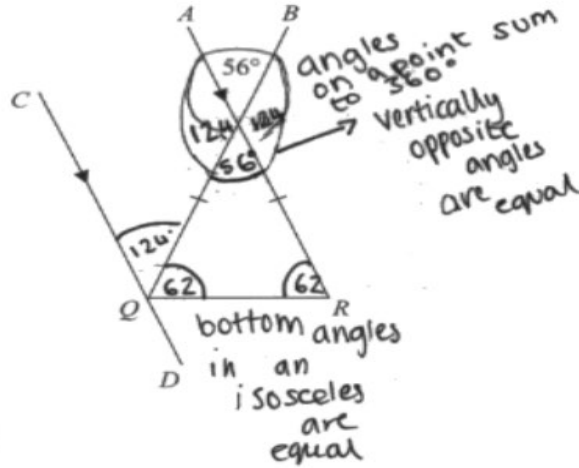
The final line of working leads to the correct answer of 118 and this is their final answer for angle CQR. Although this angle is not labelled as it is their final answer from the question stated, this will be condoned as there is no ambiguity or contradiction.

Note - If the candidate had then written  $118 \div 2 = (59)$  the A1 mark would not be awarded as we cannot isw. However, if they had clearly identified 118 as CQR and then written  $118 \div 2$  we can award the A1 mark.

- Question: 11 13 14 19 20 24 25 26 28

Question 20 - Response C

20 In the diagram,  $PQR$  is an isosceles triangle with  $PQ = PR$ .



$APR$  and  $CQD$  are parallel lines.  
 $BPQ$  is a straight line.

Angle  $APB = 56^\circ$

Work out the size of angle  $CQR$ .  
 Give a reason for each stage of your working.

$$180 - 56 = 124$$

$$124 \div 2 = 62$$

$$360 - 56 - 56 = 248$$

$$248 \div 2 = 124$$

$$62 + 124 = \underline{\underline{186^\circ}}$$

3 / 5

Q20

Navigation icons: question mark, checkmark, list, bar chart, pencil, and options A, B, C.

M2 C0 C1 A0

The correct angles of 56 and 62 are seen in the diagram and score the method marks.

The second C1 mark can be awarded for "vertically opposite" - the other reason is not complete as the key words underlined in the mark scheme are not present.

- Question: **11** **13** **14** **19** **20** **24** **25** **26** **28**

### Question 24

 Question    Mark Scheme    Examiner Comments

 Performance    Response A    Response B    Response C

 **Question 24 - Question**

**24** Rick, Selma and Tony are playing a game with counters.  
Rick has some counters.  
Selma has twice as many counters as Rick.  
Tony has 6 counters less than Selma.  
In total they have 54 counters.

the number of counters Rick has : the number of counters Tony has = 1 :  $p$

Work out the value of  $p$ .

$p = \dots\dots\dots$   
**(Total for Question 24 is 5 marks)**

- Question: **11** **13** **14** **19** **20** **24** **25** **26** **28**

 **Question 24 - Mark Scheme**

Question	Answer	Mark	Mark scheme	Additional guidance
24	1.5	P1 P1 P1 P1 A1	for process to develop 3 algebraic expressions, eg. (R =) $n$ , (S =) $2n$ , (T =) $2n - 6$ , oe, at least two must be correct. or for selecting 3 values satisfying the given criteria, eg. (R =) 10, (S =) 20, (T =) 14 for process to sum 3 algebraic expressions and equating to 54, eg. $n + "2n" + "2n - 6" = 54$ or for finding the correct sum of their values eg. "10" + "20" + "14" = 44 for start of process to solve the correct linear equation, eg. $5n = 54 + 6$ ( $n = 12$ ) or for 12, 24, 18 for "12" : $2 \times "12" - 6$ oe eg 12 : 18 oe or 18 : 12 linked to T, R	Accept 1 : 1.5 etc as answer

 **Question 24 - Examiner Comments**

In this question many students were able to find the number of counters each person would get. There were two main routes to these values: algebraic and numeric. Weaker students started by dividing 54 by 3 but were then unsure of where to go from there.

Students who adopted a clear algebraic approach often went on to solve the question completely. However, students occasionally ended up with  $4x - 6 = 54$  rather than  $5x - 6 = 54$ , due to not understanding that Tony had six less counters than Selma rather than Rick.

Most students adopted a numeric approach, and most were successful in arriving at the three numbers 12, 24 and 18 scoring three marks.

Students were less successful in converting the counters each had into a ratio between Rick and Tony. Where students managed this, they usually then went on to gain the full marks for  $p = 1.5$  but those who did not recognise this unitary ratio expression were sometimes put off from writing their ratio of Rick to Tony.

Q24











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Question:

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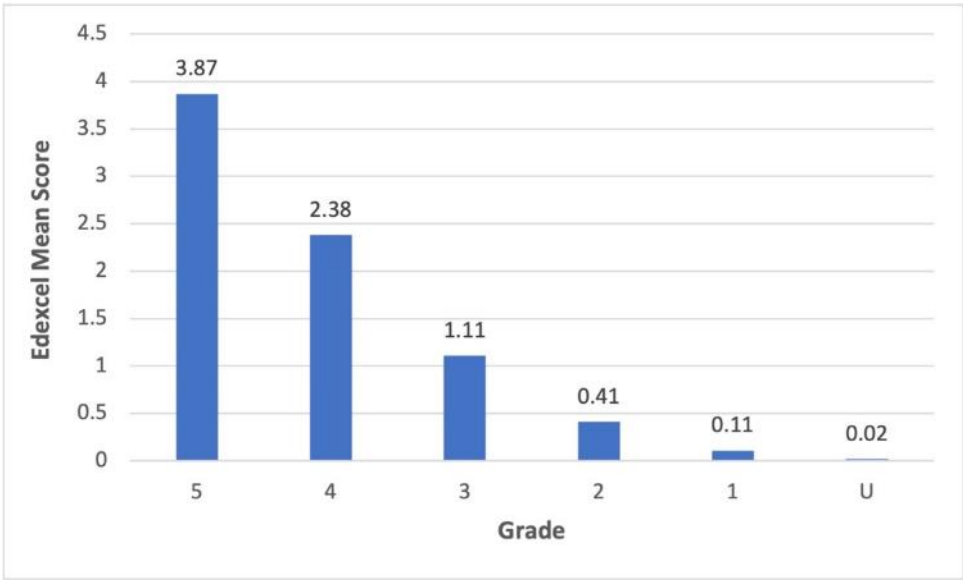
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 **Question 24 - Performance**

Mean score	Max score	Mean %	Edexcel averages: mean scored by candidates achieving grade:						
			ALL	5	4	3	2	1	U
1.51	5	30	1.51	3.87	2.38	1.11	0.41	0.11	0.02



Q24



A

B

C



Question:

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 **Question 24 - Response B**

24 Rick, Selma and Tony are playing a game with counters.

Rick has some counters.  
Selma has twice as many counters as Rick.  
Tony has 6 counters less than Selma.

In total they have 54 counters.

the number of counters Rick has : the number of counters Tony has = 1 : p

Work out the value of p.

7 : 1 : p

54

$S = 20$	$S = 24$	$\div 2$	12	$\div 3$	4
$R = 10$	$R = 12$		6		2
$T = 14$	$T = 18$		9		3
<u>44</u>	<u>54</u>				

or

p = 4

**3 / 5**

P3 P0 A0


P1 for 3 values satisfying the given criteria (20, 10, 14)


P1 for summing these values (=44)


P1 for adjusting these to give the values 12, 24, 18  
(NB 12, 24, 18 in any order would gain P3)


A0 No ratio, so no further marks.


Q24











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C

Question:

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 Question 24 - Response C

24 Rick, Selma and Tony are playing a game with counters.

Rick has some counters.  
Selma has twice as many counters as Rick.  
Tony has 6 counters less than Selma.

In total they have 54 counters.

the number of counters Rick has : the number of counters Tony has = 1 : p

Work out the value of p.

Handwritten work showing algebraic steps:

$$R : S : T = 54$$

$$1 : 2 : 0.3$$

$$54 \div 3 = 18.6$$

$$S = 2 \times R$$

$$T = 2 \times R - 6$$

$$T = 2R - 6$$

$$2R = T + 6$$

$$2R = 6T$$

$$T = \frac{2R}{6} = 0.3$$

$$R : S : T = 54$$

$$1 : 2 : 0.3$$


$$T = 2R - 6$$


$$196 : 372 : 5.58 = 61.28$$


$$p = 5.58$$


1 / 5


Q24











A

B

C

P1 P0 P0 P0 A0

P1 for 2 of the 3 correct algebraic expressions. It is quite acceptable to use R as the letter for the algebraic statements. Hence the two correct expressions  $2xR$  and  $2xR-6$  allow the award of the first mark (the R for Rick being implied).

Further attempts to combine the algebra, and find numbers that fit, are incomplete, so just the first P mark.

Question:

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## Question 25

 Question Mark Scheme Examiner Comments Performance Response A Response B Response C

### Question 25 - Question

25 Jo is going to buy 15 rolls of wallpaper.

Here is some information about the cost of rolls of wallpaper from each of two shops.

<p><b>Chic Decor</b></p> <p>3 rolls for £36</p>
---

<p><b>Style Papers</b></p> <p>Pack of 5 rolls normal price £70</p> <p>12% off the normal price</p>
--

Jo wants to buy the 15 rolls of wallpaper as cheaply as possible.

Should Jo buy the wallpaper from Chic Decor or from Style Papers?

You must show how you get your answer.






(Total for Question 25 is 4 marks)

- Question: 11 13 14 19 20 24 25 26 28

 **Question 25 - Mark Scheme**

Question	Answer	Mark	Mark scheme	Additional guidance
25	Chic Decor (supported)	P1	for process to find cost of 15 rolls from Chic Decor, eg $\frac{15}{3} \times 36 (= 180)$ or for process to find cost of 15 rolls from Style Papers at normal price, eg $\frac{15}{5} \times 70 (= 210)$ or for process to find cost of 1 roll from Chic Decor, eg $36 \div 3 (= 12)$ or for process to find cost of 1 roll from Style Papers, eg $70 \div 5 (= 14)$ or for process to find the cost of 5 rolls from Chic Decor, eg $\frac{36}{3} \times 5 (= 60)$	Could compare the costs for any number of rolls
		P1	for any first step in using the discount at Style Papers, eg $0.12 \times "210" (= 25.2(0))$ or $0.12 \times "14" (= 1.68)$ or $0.12 \times 70 (= 8.4(0))$ or $1 - 0.12 (= 0.88)$	
		P1	for full process to find cost from Style Papers, eg. $"210" - "25.2" \text{ oe } (=184.8(0))$ or $"0.88" \times "210"$ or for $"14" - "1.68" \text{ oe } (= 12.32)$ or $"0.88" \times "14"$ or for $70 - "8.4(0)" \text{ oe } (= 61.6(0))$ or $"0.88" \times 70$	
		C1	for Chic Decor with fully correct figures eg 180 and 184.8(0) or 12 and 12.32 or 60 and 61.6(0)	

Q25

  
  
  
  
  
A  
B  
C

Question:

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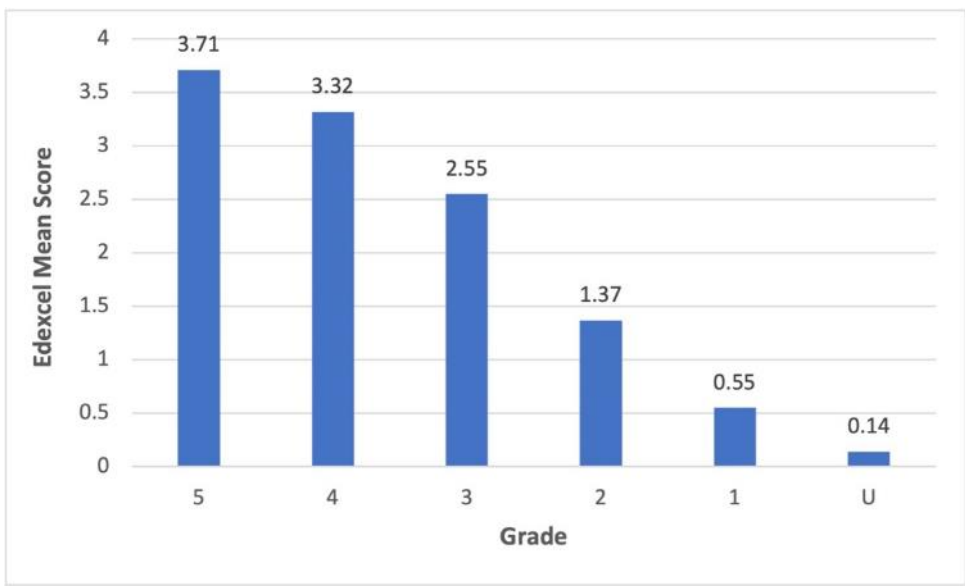
28

 **Question 25 - Examiner Comments**


Despite being later in the paper it was pleasing to find many students gained full marks on this question with the vast majority able to gain at least 1 mark. There were various methods used but the most popular was to find the cost of 15 rolls for each shop. It was common to find the values £180 and £184.80 clearly stated with the correct conclusion of Chic being the cheapest. The next popular method was to work it out for 5 rolls each. Those that did not gain full marks generally made an error in calculating the percentage discount for Style Papers because they used the breakdown method with the common error of showing 2% as 0.14 rather than 1.4; a correct method to calculate an appropriate percentage was essential to proceed through this question.


 **Question 25 - Performance**


Mean score	Max score	Mean %	Edexcel averages: mean scored by candidates achieving grade:						
			ALL	5	4	3	2	1	U
2.34	4	59	2.34	3.71	3.32	2.55	1.37	0.55	0.14





Q25











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C

Question:

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 **Question 25 - Response A**

25 Jo is going to buy 15 rolls of wallpaper.

Here is some information about the cost of rolls of wallpaper from each of two shops.

**Chic Decor**

3 rolls for £36

$1 = 12$

**Style Papers**

Pack of 5 rolls  
normal price £70

12% off the normal price

$$70 \times 0.88 = 61.60$$

$$\frac{61.60}{5} = 12.32$$

Jo wants to buy the 15 rolls of wallpaper as cheaply as possible.

Should Jo buy the wallpaper from Chic Decor or from Style Papers?  
You must show how you get your answer.

$$36 \div 3 = 12$$

$$70 \times 0.88 = 61.60$$

$$61.60 \div 5 = 12.32$$

Chic is cheapest at £12 per roll.

4 / 4

P1 P1 P1 C1

**P1 P1 P1** fully correct method seen by calculating the cost per roll for each of the shops. Chic Decor £12 **and** Style Papers £12.32 are correct figures.

**C1** The conclusion is correct with correct values.

Q25



A

B

C

- Question: 11 13 14 19 20 24 25 26 28

Question 25 - Response B

25 Jo is going to buy 15 rolls of wallpaper.  
Here is some information about the cost of rolls of wallpaper from each of two shops.

<p><b>Chic Decor</b></p> <p>3 rolls for £36</p>	<p><b>Style Papers</b></p> <p>Pack of 5 rolls normal price £70 -12% off the normal price</p>
---	--

Jo wants to buy the 15 rolls of wallpaper as cheaply as possible.  
Should Jo buy the wallpaper from Chic Decor or from Style Papers?  
You must show how you get your answer.

$£30 \times 5 = £180$   
 $£70 = 5$   
 $70 \div 5 = £14 = \text{one roll}$   
 $£61.00 - 12\% \text{ of } 5$   
 $£14.00 +$   
~~£14.00~~  
~~£14.00~~  
~~£14.00~~  
~~£14.00~~  
~~£14.00~~  
~~£14.00~~  
 $£61.00 \times 3$   
 $£184.30^3$

$12\% \text{ of } 70$   
 $£7 = 10\%$   
 $£1.40 = 2\%$   
 $£8.40 \text{ off}$   
 $70 - 8.40 = 61.60$   
 $61.60 \times 3 = 184.80$

Chic Decor is the cheaper way to buy 15 rolls of wallpaper.

3 / 4

Q25

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✓

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Bar chart icon

✎

A

B

C

- P1 P1 P1 C0
- P1 The process to find cost of 15 rolls for Chic Decor is correct.
- P1 The process to find the discount at Style Papers is correct.
- P1 The process to find cost of 15 discounted rolls at Style Papers is correct (61.60 x 3).
- C0 The result of the calculation 61.6 x 3 is wrong so the figures are not fully correct. Note sight of 61.6 alone would get the 2nd and 3rd P marks.

- Question: 11 13 14 19 20 24 25 26 28

Question 25 - Response C

25 Jo is going to buy 15 rolls of wallpaper.  
Here is some information about the cost of rolls of wallpaper from each of two shops.

**Chic Decor**  
3 rolls for £36

**Style Papers**  
Pack of 5 rolls  
normal price £70  
12% off the normal price

Jo wants to buy the 15 rolls of wallpaper as cheaply as possible.  
Should Jo buy the wallpaper from Chic Decor or from Style Papers?  
You must show how you get your answer.

$15 \times 3 = 45$   
 3, 6, 9, 12, 15  
 $36, \downarrow \downarrow \downarrow \downarrow$   
 $72 \quad 108 \quad 144 \quad 180$   
 overall £180 for 15.

$15 \times 5 = 75$   
 5, 10, 15  
 $70 \downarrow \downarrow$   
 $140 \quad 210$   
 $210 \times 12\% = 25.2$   
 cheaper for style papers as it'll be £25.2p.

(Total for Question 25 is 4 marks)

2 / 4

Q25

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Bar chart icon

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A

B

C

P1 P1 P0 C0

P1 The process for Chic Decor is correct.

P1 The process to find the discount at Style Papers is correct (25.2)

P0 Since no further process shown to find the discounted cost from Style Papers.

C0 Figures are not fully correct for comparison.

Question:

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## Question 26

Question

Mark Scheme

Examiner Comments

Performance

Response A

Response B

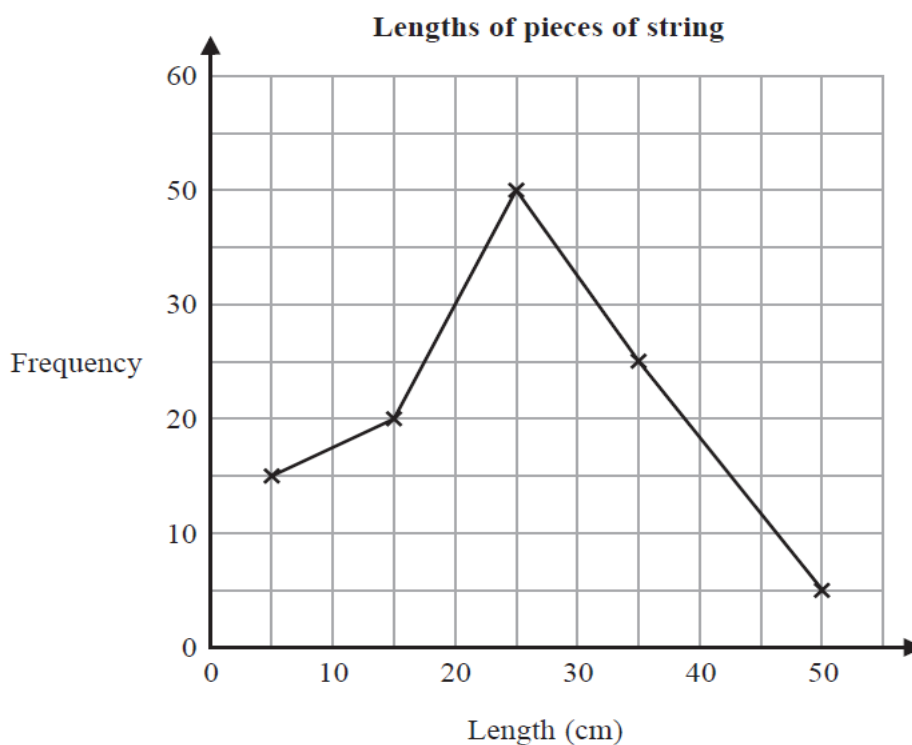
Response C

### Question 26 - Question

26 The table gives information about the lengths, in cm, of some pieces of string.

Length ( $t$ cm)	Frequency
$0 < t \leq 10$	15
$10 < t \leq 20$	20
$20 < t \leq 30$	50
$30 < t \leq 40$	25
$40 < t \leq 50$	5

Amos draws a frequency polygon for the information in the table.



Write down **two** mistakes that Amos has made.

(Total for Question 26 is 2 marks)



Question:

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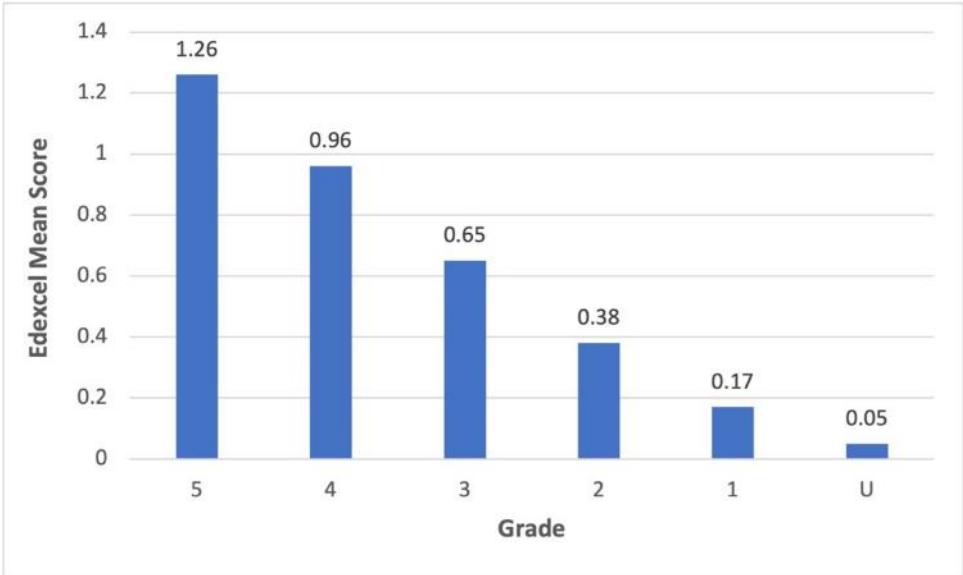
25

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 **Question 26 - Performance**

Mean score	Max score	Mean %	Edexcel averages: mean scored by candidates achieving grade:						
			ALL	5	4	3	2	1	U
0.68	2	34	0.68	1.26	0.96	0.65	0.38	0.17	0.05



Q26



A

B

C

Question:

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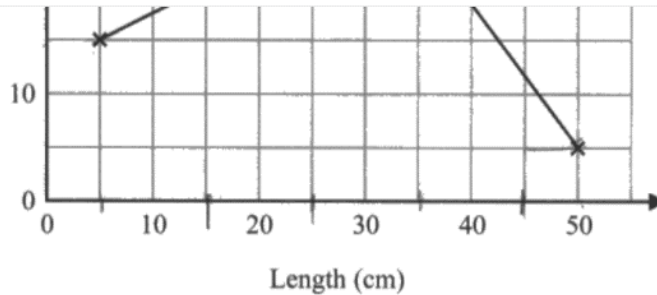
25

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Question 26 - Response A



Write down **two** mistakes that Amos has made.

1. didnt plot in between 40 and 50 as it was 45 cm not 50
2. missed out 40 on the frequency as it goes up in 10s

(Total for Question 26 is 2 marks)

2 / 2

C1 C1

C1 Sufficient to identify the plotting error.

C1 Correctly states 40 is missing on the correctly identified axis.

Some parts of statements are vague or irrelevant but nothing is contradictory or incorrect.

Q26



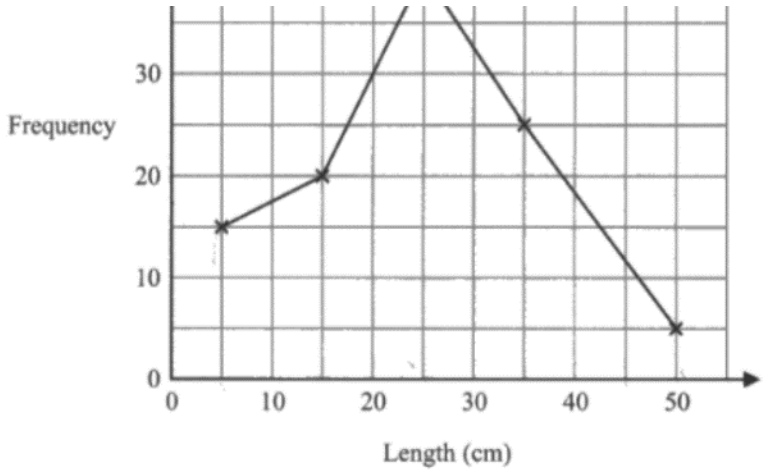
A

B

C

- Question: 11 13 14 19 20 24 25 26 28

 Question 26 - Response B



Write down **two** mistakes that Amos has made.

1. they didn't start the graph at 0
2. for the last one, the point should be at 45, 5

(Total for Question 26 is 2 marks)


**1 / 2**


C0 C1


C0 Commonly seen incorrect answer.


C1 Identifies the error and states the correct coordinates. Condone missing brackets from (45 , 5)


Q26











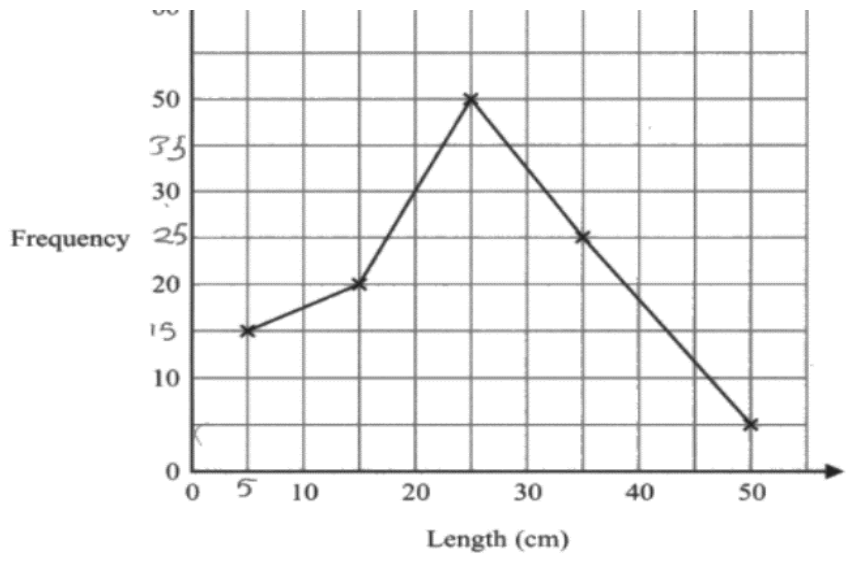
A

B

C

- Question: 11 13 14 19 20 24 25 26 28

 Question 26 - Response C



Write down **two** mistakes that Amos has made.

he didn't do the graph frequency number  
correctly  
he didn't plot them correctly

(Total for Question 26 is 2 marks)

**1 / 2**

C1 C0

C1 This is the minimum acceptable response as the correct axis has been identified C1

C0 A general, vague, cover-all comment that fails to indicate which point was wrongly plotted.

If more than 2 reasons are presented, we mark the best 2 as long as any correct ones are not contradicted elsewhere.

Q26



A

B

C

- Question: [11](#) [13](#) [14](#) [19](#) [20](#) [24](#) [25](#) [26](#) [28](#)

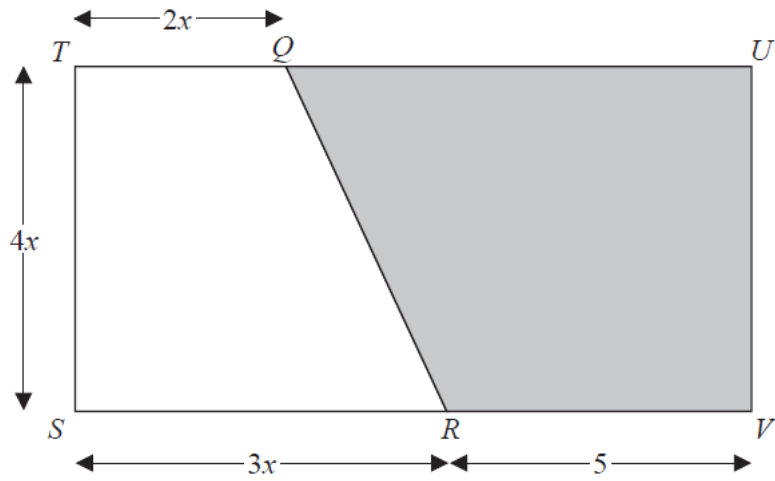
### Question 28

[? Question](#)
[✓ Mark Scheme](#)
[☰ Examiner Comments](#)

[📊 Performance](#)
[📄 Response A](#)
[📄 Response B](#)
[📄 Response C](#)

**? Question 28 - Question**

28 The diagram shows rectangle  $STUV$ .  
 $TQU$  and  $SRV$  are straight lines.  
 All measurements are in cm.



The area of trapezium  $QUVR$  is  $A \text{ cm}^2$   
 Show that  $A = 2x^2 + 20x$






(Total for Question 28 is 3 marks)

- Question: 11 13 14 19 20 24 25 26 28

 **Question 28 - Mark Scheme**

Question	Answer	Mark	Mark scheme	Additional guidance
28	Complete chain of reasoning	M1	for (area of trapezium $TQRS = 0.5 \times 4x \times (2x + 3x)$ or for (area of rectangle $TUVS = 4x \times (3x + 5)$ ( $= 12x^2 + 20x$ )	Evidence for the award of marks may be seen on the diagram  Alternative methods may be seen.  Accept $x$ for $(3x - 2x)$
		M1	for (area of trapezium $QUVR = 4x(3x + 5) - 0.5 \times 4x \times (2x + 3x)$	
		C1	for correct algebraic processing and simplification to the given form	
		M1	<b>Alternative 1</b> for ( $QU = 3x + 5 - 2x (= x + 5)$ )	
		M1	for (area of trapezium $QUVR = 0.5 \times 4x \times ((x + 5) + 5)$ or $0.5 \times 4x \times (x + 10)$	
		C1	for correct algebraic processing and simplification to the given form	
		M1	<b>Alternative 2</b> for (area of triangle $= 0.5 \times (3x - 2x) \times 4x$ or for (area of rectangle $= 4x \times 5$ )	
		M1	for (area of trapezium $QUVR = 0.5 \times (3x - 2x) \times 4x + 4x \times 5$	
		C1	for correct algebraic processing and simplification to the given form	

Q28

  
  
  
  
  
A  
B  
C

 **Question 28 - Examiner Comments**

Most students left this question blank. Almost all of the successful students split  $QRVU$  into a rectangle and a triangle but complete methods were rare. A few were able to gain a mark for the area of the rectangle or triangle. Students showed a lack of understanding in cases where attempts were made by trying to find the area of the trapezium by using numerical values for the sides of the rectangle, trying to write an expression by adding the perimeter or parts of the perimeter or trying to rearrange  $A = 2x^2 + 20x$ . The majority of the marks that were given were for  $4x \times 5 = 20x$ .

Question:

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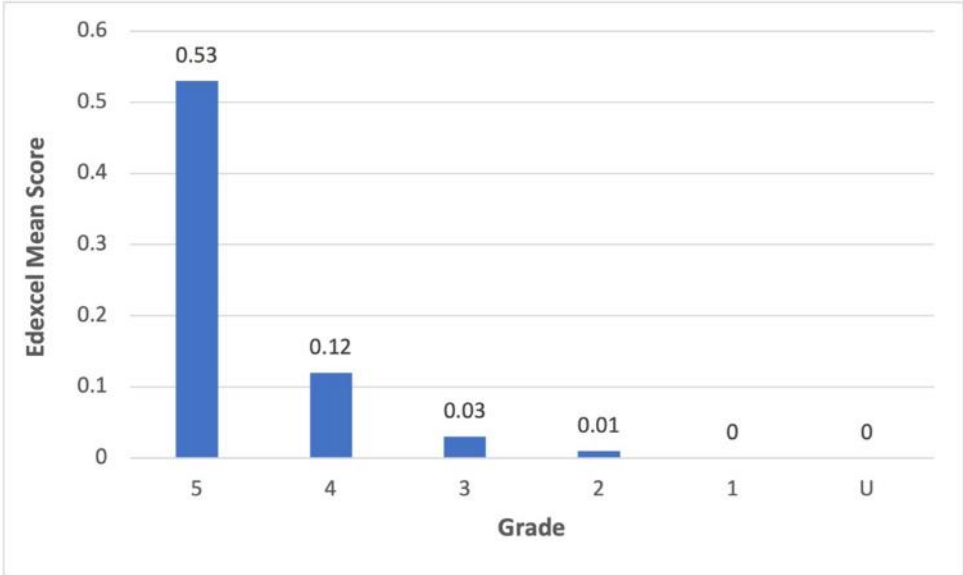
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

28

 **Question 28 - Performance**

Mean score	Max score	Mean %	Edexcel averages: mean scored by candidates achieving grade:						
			ALL	5	4	3	2	1	U
0.11	3	4	0.11	0.53	0.12	0.03	0.01	0.00	0.00



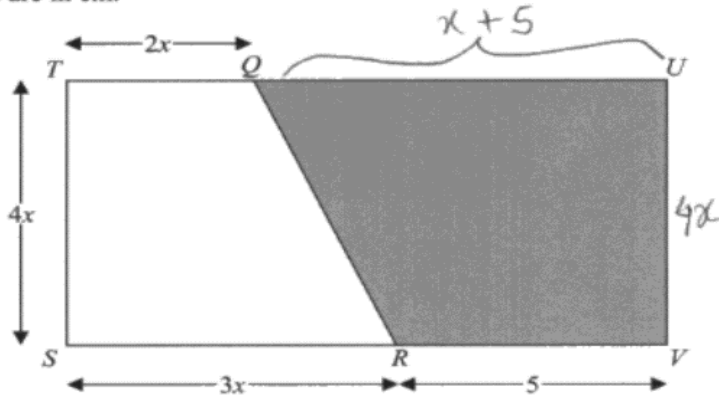
Q28

?  
 ✓  
 ☰  
   
   
 A  
 B  
 C

- Question: 11 13 14 19 20 24 25 26 28

 **Question 28 - Response A**

28 The diagram shows rectangle  $STUV$ .  
 $TQU$  and  $SRV$  are straight lines.  
 All measurements are in cm.



The area of trapezium  $QURV$  is  $A \text{ cm}^2$   
 Show that  $A = 2x^2 + 20x$

~~$(5+3-2x) \times$~~

Area of trapezium =  $\frac{a+b}{2} \times h$

~~$\frac{2x+(x+5)}{2} \times 4x$~~       $\frac{x+5+5}{2} \times 4x$

~~$\frac{3x^2+20x}{2}$~~       $\left(\frac{x+10}{2}\right) \times 4x$

~~$\therefore 2A = \frac{3x^2+20x}{2}$~~

$\therefore 2A = 2x^2 + 20x$


Q28

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Bar chart icon



A

B

C

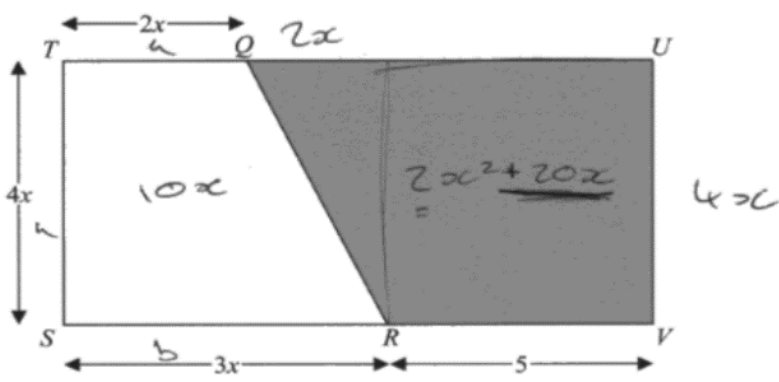
3 / 3

- M1 M1 C1 From the alternative 1.
- M1 The correct length for QU is clearly shown on the diagram.
- M1 The area of the trapezium QURV is correctly expressed using QU.
- C1 This is then correctly simplified to the given form.

- Question: 11 13 14 19 20 24 25 26 28

 **Question 28 - Response B**

28 The diagram shows rectangle  $STUV$ .  
 $TQU$  and  $SRV$  are straight lines.  
 All measurements are in cm.



The area of trapezium  $QUVR$  is  $A \text{ cm}^2$   
 Show that  $A = 2x^2 + 20x$

trapezium  
 $\frac{1}{2}(a+b)h$   
 $\frac{1}{2}(2+3)4 =$

$5 \times 4x = 20x = \boxed{20x}$   
 $2x \times 2x = 4x^2 \div 2 = 2x^2$   
 $A = \frac{QUVR}{2x^2 + 20x}$

1 / 3

Q28

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A

B

C

M1 M0 C0 Using alternative method 2.

M1 The candidate has correctly found the area of the rectangle.

M0 The candidate has written  $2x$  on the diagram which is incorrect. They have then used this in their attempt to find the triangle area so although they have written an apparently correct answer it has come from incorrect working.

C0 They cannot therefore gain the C mark.

Question:

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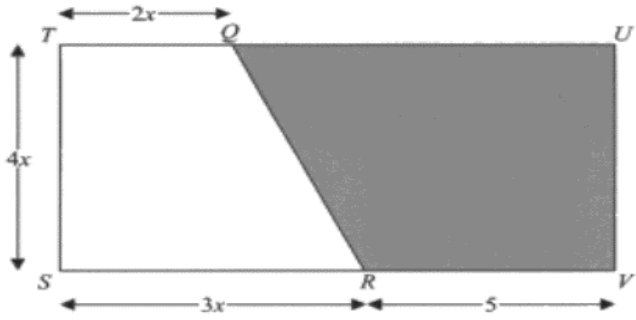
25

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Question 28 - Response C

28 The diagram shows rectangle  $STUV$ .  
 $TQU$  and  $SRV$  are straight lines.  
 All measurements are in cm.



The area of trapezium  $QUVR$  is  $A \text{ cm}^2$

Show that  $A = 2x^2 + 20x$

$$\begin{aligned}
 h &= 4x \\
 3x + 2x &= 5x \\
 \frac{1}{2} (2 + 5)h \\
 2.5 \\
 2.5 \times 4x &= 10x \\
 2(1^2) + 20 &= 22
 \end{aligned}$$

0 / 3

Q28

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✓

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Bar chart icon

✍️

A

B

C

M0 M0 C0

The candidate has attempted to substitute in the trapezium area formula for the white trapezium but has left out the  $x$