Pearson Edexcel

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

November 2022 Exemplar
1MA1-2F Paper 2 (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 November 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 November 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, the marks awarded, and the common errors for this sort of question.

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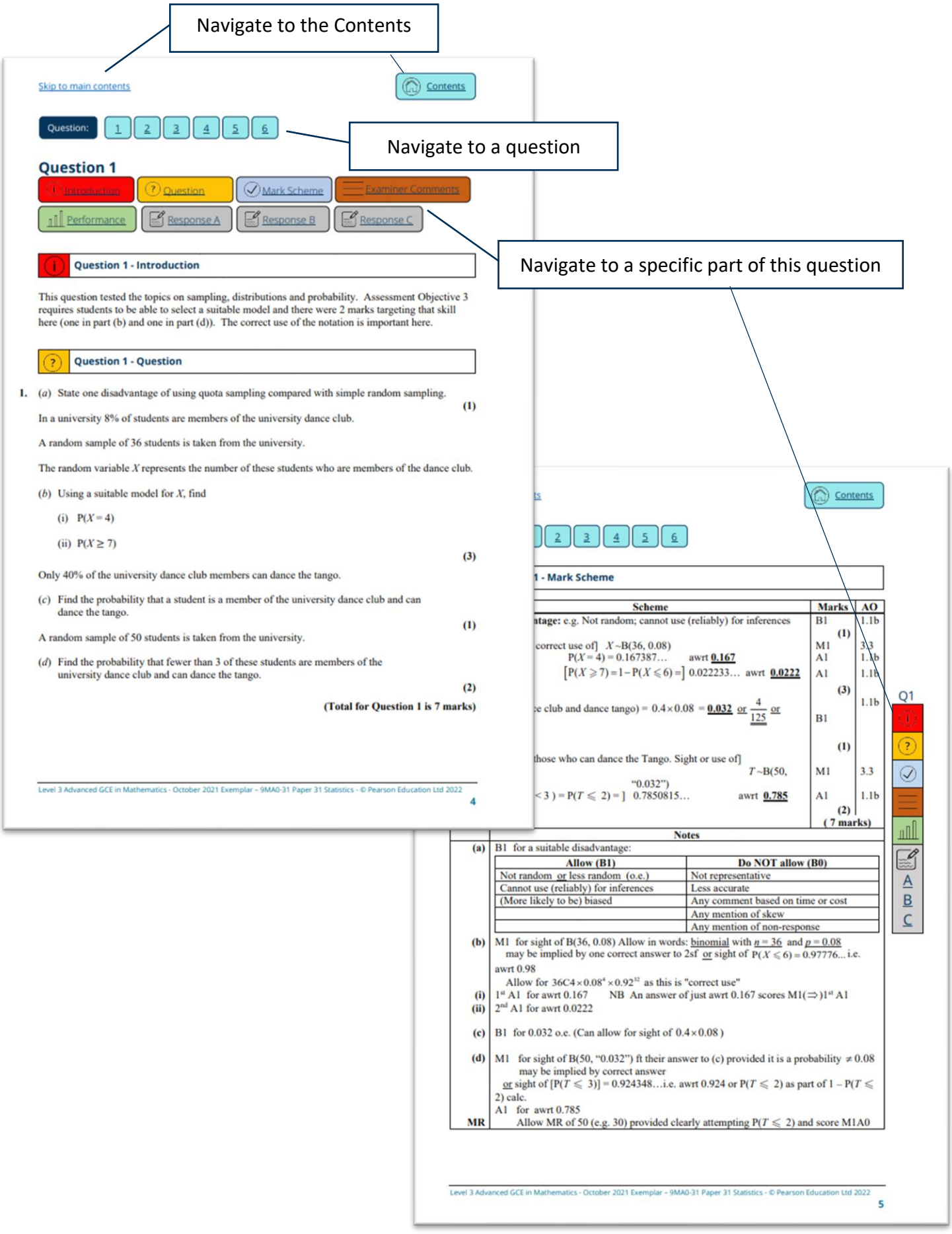
How to use this booklet



General Examiner Feedback

The paper was accessible to students with a good amount of working shown over most of the paper. Some questions, towards the end of the paper, were not as well answered by students but this was due to the differentiation and ramping of the paper.

This is a paper that requires the use of a calculator and students are expected to have access to and use a calculator. There is much that students continue to try to use chunking methods when working out percentages even when they have a calculator. This can take longer and often leads to inaccurate answers through incorrect combining of chunks.

Students should read the questions carefully and ensure they fully answer the question asked. Some problems are set in small real-life situations (non-mathematical settings) and it would be beneficial for centres to ensure all students have a working knowledge of reading timetables and working with different types of bills.

Question 7

Question | Mark Scheme | Examiner Comments

Performance | Response A | Response B | Response C

Question 7 - Question

7 Myles writes down the distance readings from his car at the start and end of a journey.

Start of journey	1 2 4 6 8	miles
End of journey	1 2 8 4 5	miles

Myles knows that the cost of petrol for this journey is 13p per mile.

Work out the total cost of the petrol used for this journey.
Give your answer in pounds.

£.....

(Total for Question 7 is 4 marks)

Question 7 - Mark Scheme

Question	Answer	Mark	Mark scheme	Additional guidance
7	49.01	P1	for process to work with the number of miles, eg 12845 – 12468 (= 377) **or** 12845 × 13 (= 166985) **or** 12468 × 13 (= 162084)	
		P1	for process to find the cost, eg "377" × 13 (= 4901) **or** "166985" – "162084" (= 4901)	
		B1	(indep) for converting from pence to pounds, eg "4901" ÷ 100 **or** 13 ÷ 100 **or** miles divided by 100 eg "377" ÷ 100 (= 3.77) or 12845 ÷ 100 (= 128.45) **and** 12468 ÷ 100 (= 124.68)	This mark can be awarded at any stage in the process
		A1	49 or 49.01	

Question 7 - Examiner Comments

Generally, this question was answered well with the vast majority of responses gaining some marks and the modal score was full marks.

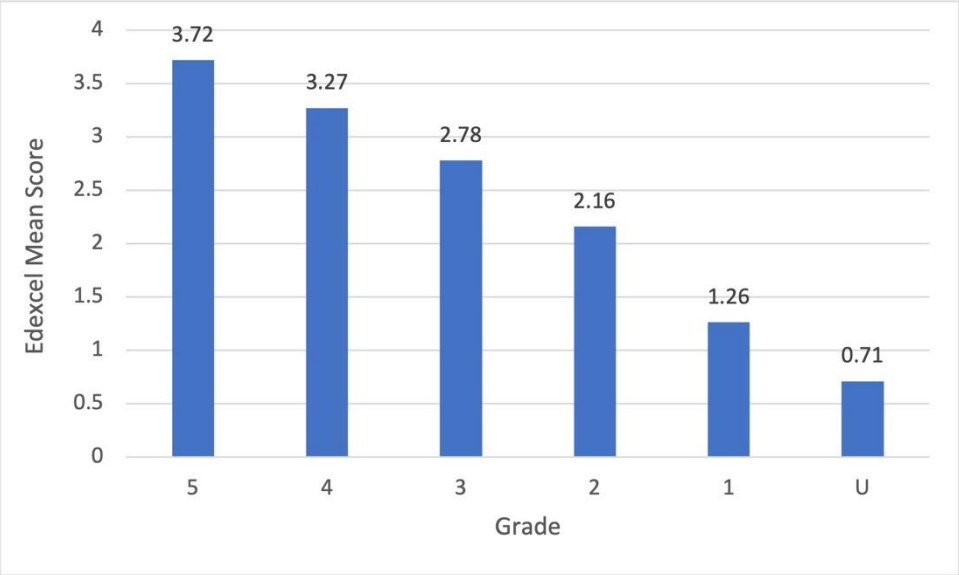
While 49.01 or 4901, forgetting to convert to pounds was often seen, the most popular incorrect approach was to divide by 13 rather than multiply. Another error seen was to add the two mileage figures.

Even students that did not know how to interpret the real life setting of the question often gained the B mark, many with the use of 0.13 in a calculation.

Another issue seen was arithmetic errors due to students trying to work without a calculator. Please encourage students to use calculators on papers 2 and 3 as they are designed for calculator use.

Question 7 - Performance

Mean score	Max score	Mean %	Edexcel averages: mean scored by candidates achieving grade:						
			ALL	5	4	3	2	1	U
2.66	4	67	2.66	3.72	3.27	2.78	2.16	1.26	0.71



Question 7 - Response A

7 Myles writes down the distance readings from his car at the start and end of a journey.

Start of journey	1	2	4	6	8	miles
End of journey	1	2	8	4	5	miles

Myles knows that the cost of petrol for this journey is 13p per mile.

Work out the total cost of the petrol used for this journey.
Give your answer in pounds.

12845 − 12468 = 377

13 × 377 = 49.01

£ 49.01p

4 /4

Q7

A
B
C

P1 can be awarded for finding the difference.
The second **P1** is awarded for working with cost, 13×377

B1 for writing the answer as 49.01, this implies the unit change.
Note: on this example either the working or the answer would have been enough.

The final answer is correct as we condone the use of p on the answer line. As this is not contradictory to the accuracy of the answer we can condone and so the final accuracy mark can be awarded.

Question 7 - Response B

7 Myles writes down the distance readings from his car at the start and end of a journey.

Start of journey	1	2	4	6	8	miles
End of journey	1	2	8	4	5	miles

Myles knows that the cost of petrol for this journey is 13p per mile.

Work out the total cost of the petrol used for this journey.
Give your answer in pounds.

12845 − 12468 = 317

4121

317 × 13 = ~~29~~

4121 ÷ 100 = 41.21

£ 41.21

Q7

A B C

3 /4

P1 for the process to subtract to find the number of miles travelled.
Note: the answer of 317 is incorrect but the process is seen and so the mark can be awarded.

P1: "377" ×13 is working with costs, carrying forward their calculated figure.
B1 as 4121÷100 is the independent money conversion and there is no doubt that they are converting their total cost.

A0 as the answer is incorrect due to the original arithmetic error and so the accuracy mark cannot be awarded.

Question 7 - Response C

7 Myles writes down the distance readings from his car at the start and end of a journey.

Start of journey	1	2	4	6	8	miles
End of journey	1	2	8	4	5	miles

Myles knows that the cost of petrol for this journey is 13p per mile.

Work out the total cost of the petrol used for this journey.
Give your answer in pounds.

End = 12,845 miles
Start = 12,468 miles

12 845 - 12 468 = 377 miles

~~377 ÷ 13 = £29~~

377 ÷ 0.13 = 2900

£ 29

2 /4

Q7

A
B
C

P1 is awarded for the subtraction to work out the number of miles travelled.
P0 the attempt to work with cost is incorrect, division not multiplication.
B1: independent mark for working with units of money can be awarded as 0.13 is seen.
A0 the answer is incorrect.

Question 9

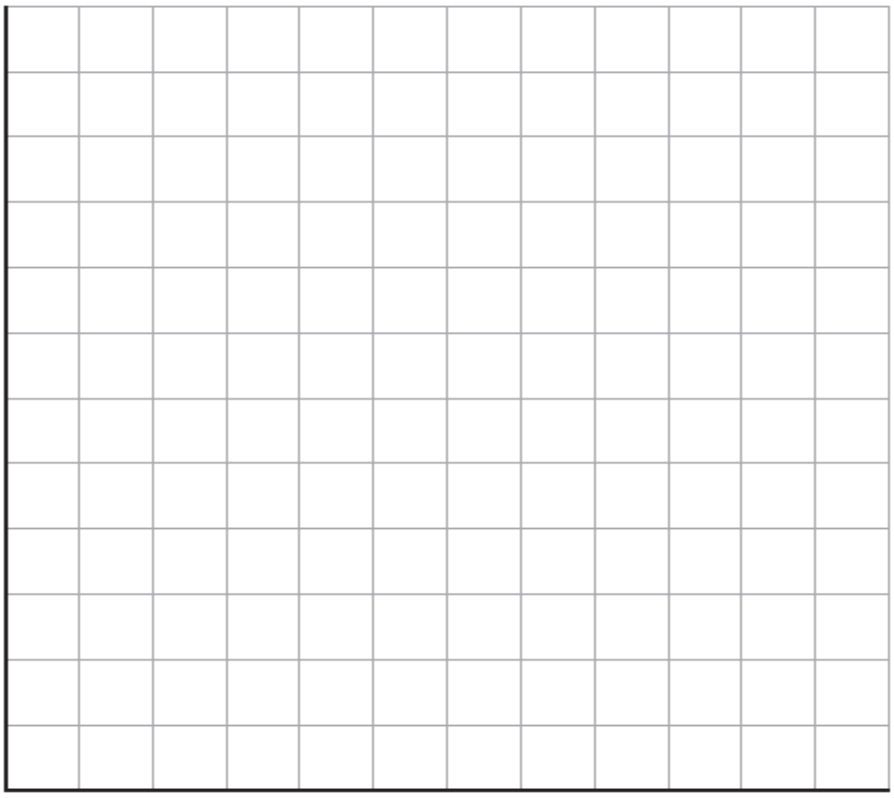
Question | Mark Scheme | Examiner Comments | Performance | Response A | Response B | Response C

Question 9 - Question

9 The table shows information about the number of students who arrived late at school each day one week.

	Number of students
Monday	9
Tuesday	10
Wednesday	8
Thursday	6
Friday	3

On the grid, draw a bar chart for this information.



(Total for Question 9 is 3 marks)

Question 9 - Mark Scheme

Question	Answer	Mark	Mark scheme	Additional guidance
9	Chart	B1	for correct day labels or a linear scale	Accept key in place of labels
		M1	for correct bars showing information for at least 3 days	Condone bars of varying widths Condone no gaps or inconsistent gaps
		A1	for a fully correct bar chart	Labels of Day and Frequency not essential

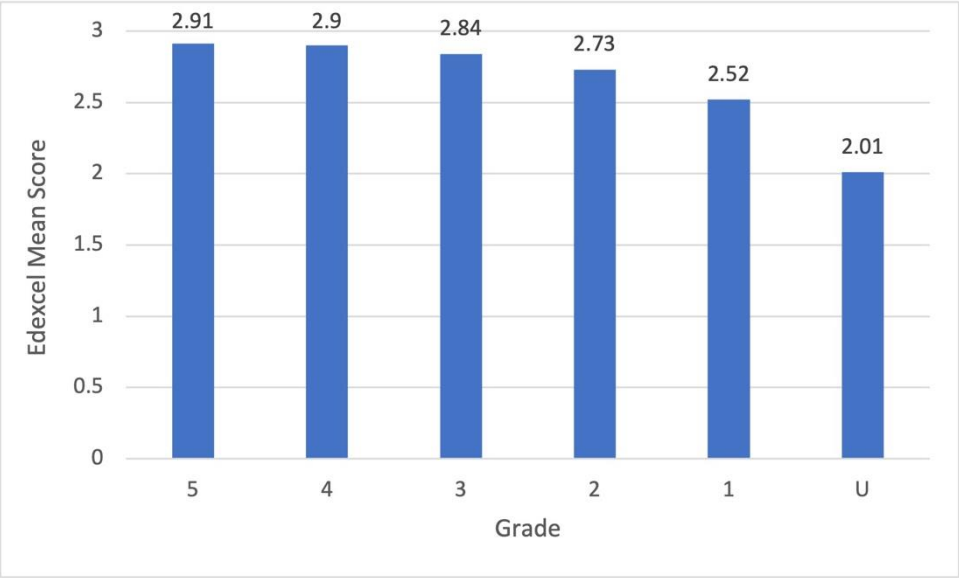
Question 9 - Examiner Comments

Most students were awarded full marks. Of those not scoring full marks, a common error was with the linear scale. Many chose an appropriate linear scale of one square to one unit, although there were some candidates who labelled the spaces rather than the lines and others who did not start their scale at zero which often resulted in the 3 bar being only 2 squares high. Other errors with linear scale included using a scale of 3 to a square or 5 to a square, which caused issues when drawing their bars as it was difficult to clearly represent all of the frequencies.

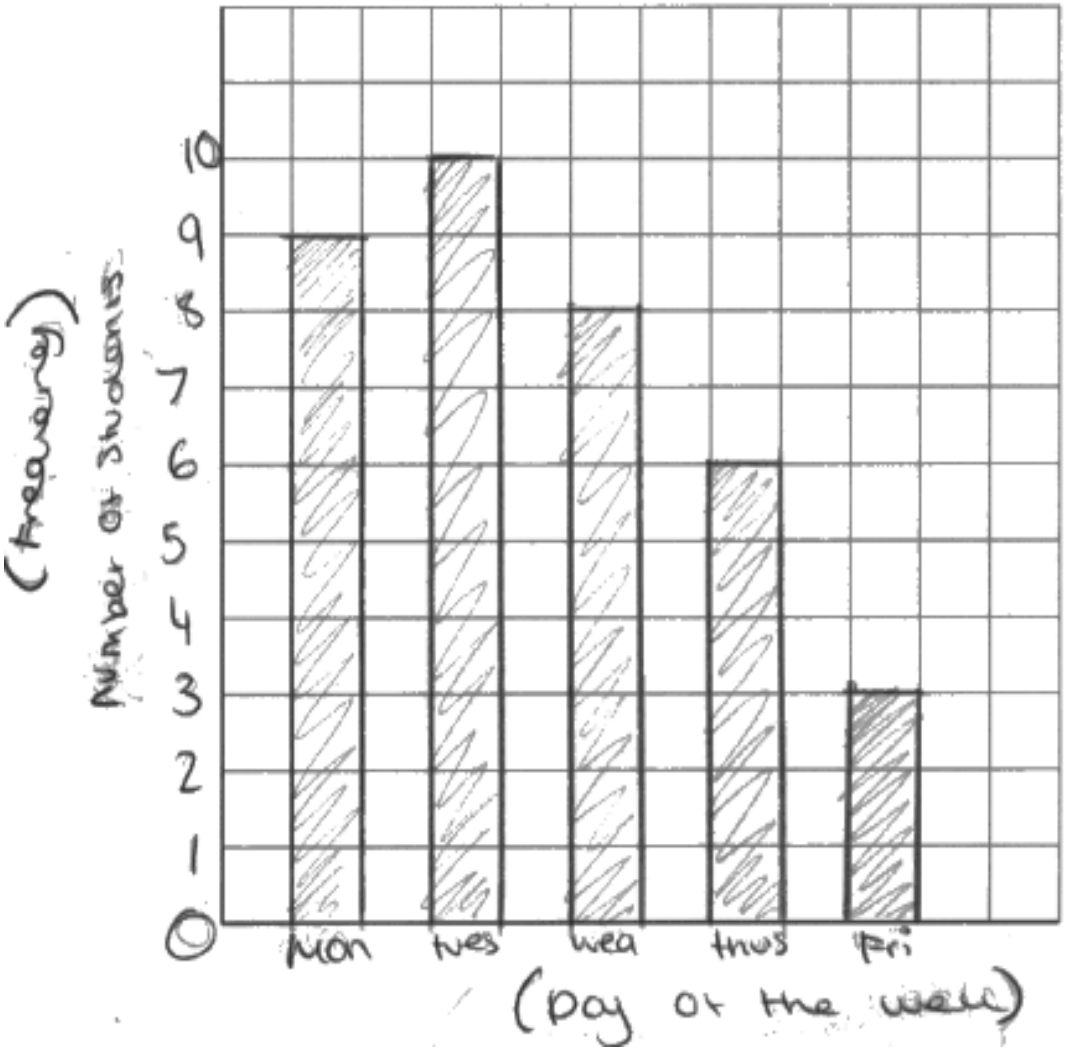
Centres should give students practice in identifying an appropriate scale when drawing graphs.

Question 9 - Performance

Mean score	Max score	Mean %	Edexcel averages: mean scored by candidates achieving grade:						
			ALL	5	4	3	2	1	U
2.80	3	93	2.80	2.91	2.90	2.84	2.73	2.52	2.01



Question 9 - Response A



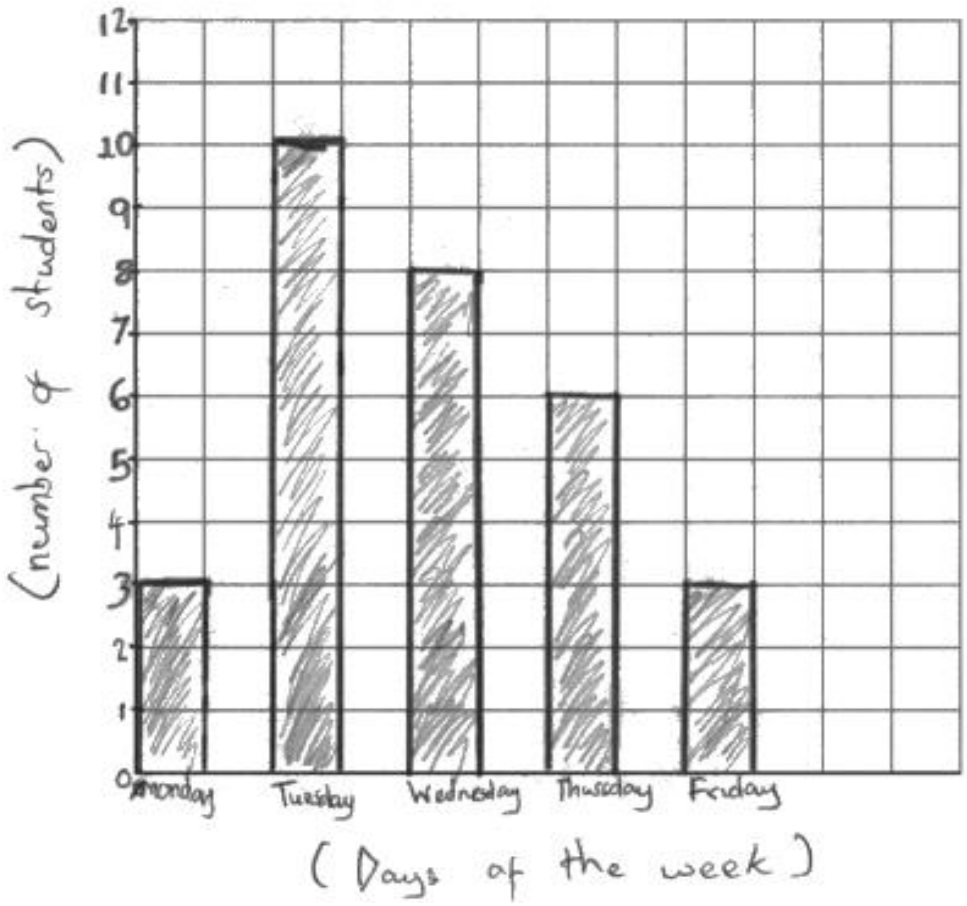
Q9

A B C

3 /3

B1 the scale mark can be awarded.
M1 here all the bars are correct so this can be given.
A1 a fully correct graph is seen.

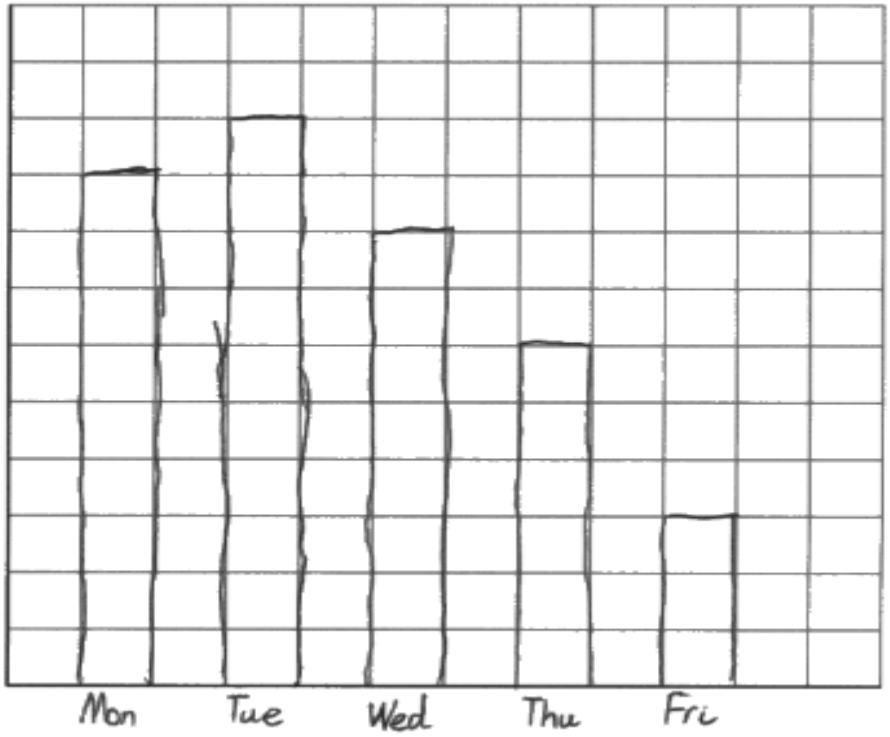
Question 9 - Response B



2 /3

B1 for a correct scale either linear or days.
M1 for at least 3 correct bars.
A0 the bar for Monday is incorrect so the final accuracy mark cannot be awarded.

Question 9 - Response C



2 /3

B1 for the days given on the *x*-axis
M1 the bars are of the correct size if you count squares, we allowed this on these simple numbers for this mark.
A0 the graph is not fully correct as there is no scale on the *y*-axis.

Question 11

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

Question 11 - Question

11 214 people go on a school trip.
The people on the trip are either adults or children.

There are 14 adults on the trip.
35% of the children on the trip are wearing a hat.

Find the number of children on the trip who are **not** wearing a hat.

.....

(Total for Question 11 is 4 marks)

Question 11 - Mark Scheme

Question	Answer	Mark	Mark scheme	Additional guidance
11	130	P1	process to find the total number of children, eg 214 – 14 (= 200)	
		P1	process to find the number of children wearing a hat, eg "200" × 35 ÷ 100 (= 70) **or** process to find the multiplier for the percentage of children not wearing a hat, eg (100 – 35) ÷ 100 (= 0.65)	
		P1	for full process to find the number of children not wearing a hat, eg "200" – "70" **or** "200" × "0.65" **or** 214 – "70" – 14	
		A1	cao	

Question 11- Examiner Comments

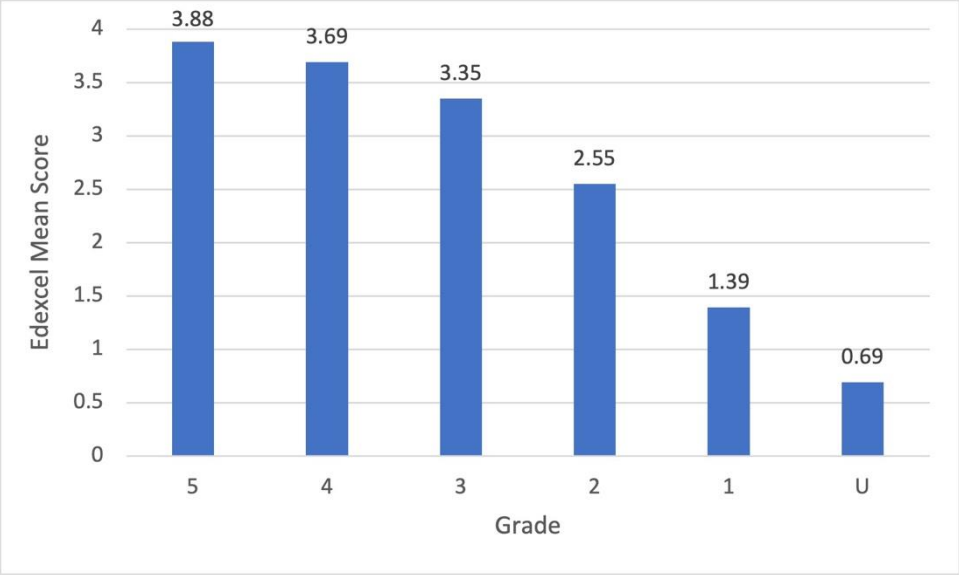
This was a well attempted question with most students gaining at least 2 process marks and the vast majority achieving full marks. However, some students did not subtract to find the total number of children first and some, despite the bold print, did not go onto find the number of children not wearing hats.

For those not scoring full marks, it was common that they scored at least one mark for saying there were 200 children. Some students stopped at finding just 35% (70) and so were only able to achieve half the marks. Common errors were to find 35% of 214 and another common error was seen when students did the build-up method for percentages. Most candidates using this method did not show what calculations they have done and so, unless their answer is correct, can have no method marks.

Centres would benefit from reminding students of the need to read the question carefully and check that their answer is reasonable. They should also be reminded to show their working out to find percentages as students often made arithmetic errors without showing the associated calculations.

Question 11- Performance

Mean score	Max score	Mean %	Edexcel averages: mean scored by candidates achieving grade:						
			ALL	5	4	3	2	1	U
3.13	4	78	3.13	3.88	3.69	3.35	2.55	1.39	0.69



Question 11 - Response A

214 people go on a school trip.
The people on the trip are either adults or children.

There are 14 adults on the trip.
35% of the children on the trip are wearing a hat.

Find the number of children on the trip who are **not** wearing a hat.

children = 200
adults = 14

70 wearing a hat (children)

130 children NOT wearing a hat.

214 - 14 = 200

35% of 200 = 200 ÷ 100 = 2

2 x 35 = 70

200 - 70 = 130

130

4 /4

P1 for finding the number of children eg 214-14 or 200.
P1 for finding 35% of 200, the processes are shown.
P1 for finding the number of adults eg 200-70
A1 for the accurate figure of 130.

Question 11 - Response B

214 people go on a school trip.
The people on the trip are either adults or children.

There are 14 adults on the trip.
35% of the children on the trip are wearing a hat.

Find the number of children on the trip who are **not** wearing a hat.

214 people, adults and children

14 = adults

200 children

35% are hat

65 are not

25% of 200 = 50

10% of 200 = 20

5% = 10

5% × 7 = 35

10 × 7 = 70

70 children

2 /4

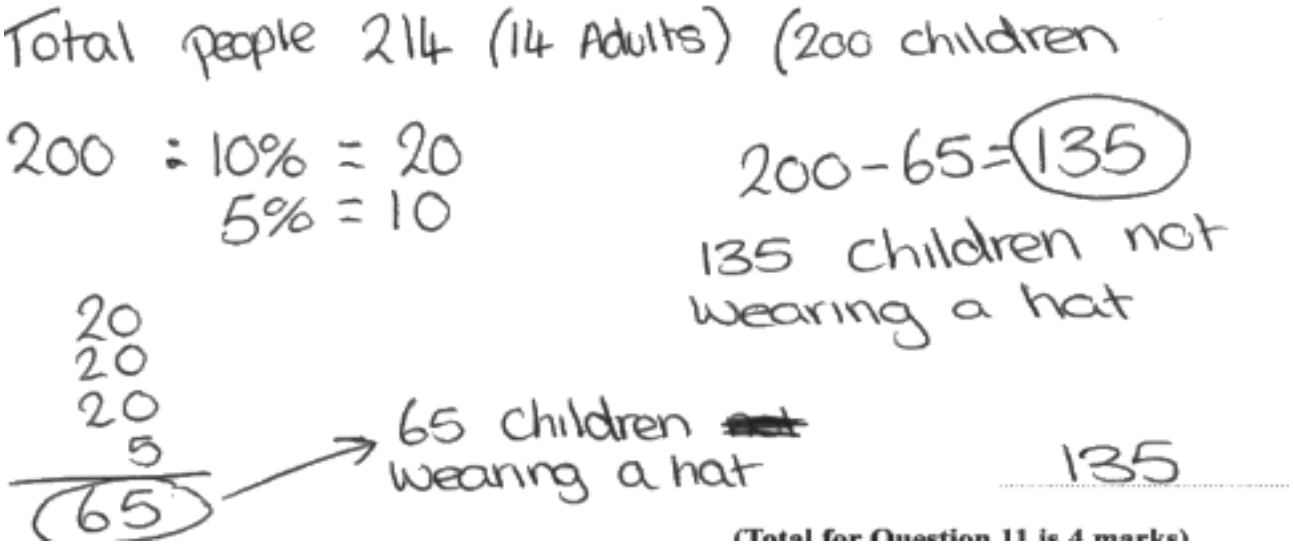
P1 for 200 children stated, note no process is seen but an accurate figure can imply the process.
P1 for finding 35% of 200 accurately. Note if figures only are stated they must be correct. It is better to show the processes used.
P0A0: No further working so no further marks can be awarded.

Question 11- Response C

214 people go on a school trip.
The people on the trip are either adults or children.

There are 14 adults on the trip.
35% of the children on the trip are wearing a hat.

Find the number of children on the trip who are **not** wearing a hat.



1 /4

P1 for 200 children stated, there is no process shown but the figure is correct.
No more marks can be awarded as the percentage work begins well but then they add 5 instead of 10 and so no full process is seen.

As the third mark is dependent by using "70" in the mark scheme, 220 -65 is not sufficient for the mark.

A0: the answer is incorrect.
Note: the 65 used is for the number of children and not at attempt to use 65%.

Question 14c

Question 14c - Question

14 There are x sweets in a box.

There are y sweets in a packet.

(c) Write an expression, in terms of x and y, for the total number of sweets in 3 boxes and 2 packets.

.....

(2)

(Total for Question 14 is 7 marks)

Question 14c - Mark Scheme

Question	Answer	Mark	Mark scheme	Additional guidance
14 (c)	$3x + 2y$	M1 A1	for $3x$ or $2y$ cao	Condone use of b and p

Question 14c - Examiner Comments

In part (a) this simplifying question was answered very well, with the majority of students being awarded both marks. The method mark was often awarded for correctly collecting like terms for one variable but often lost the second mark due to an error when working with $7d$ and $-d$. Commonly seen errors included an extra step to combine $7c$ and $6d$ to get a final answer of $13cd$ or, when working with the d variable, either misinterpreting the negative sign to get $7c - 6d$ or forgetting that this represented $1d$, resulting in $7c + 7$ being stated as the final answer. A less frequent error was to use powers when collecting like terms.

In part (b), students often struggled to expand the bracket correctly by only multiplying 5 by 2m to give 10m but failing to multiply 5 by 6 as well. Students that did correctly expand the bracket generally solved the equation successfully, with almost half of students scoring full marks.

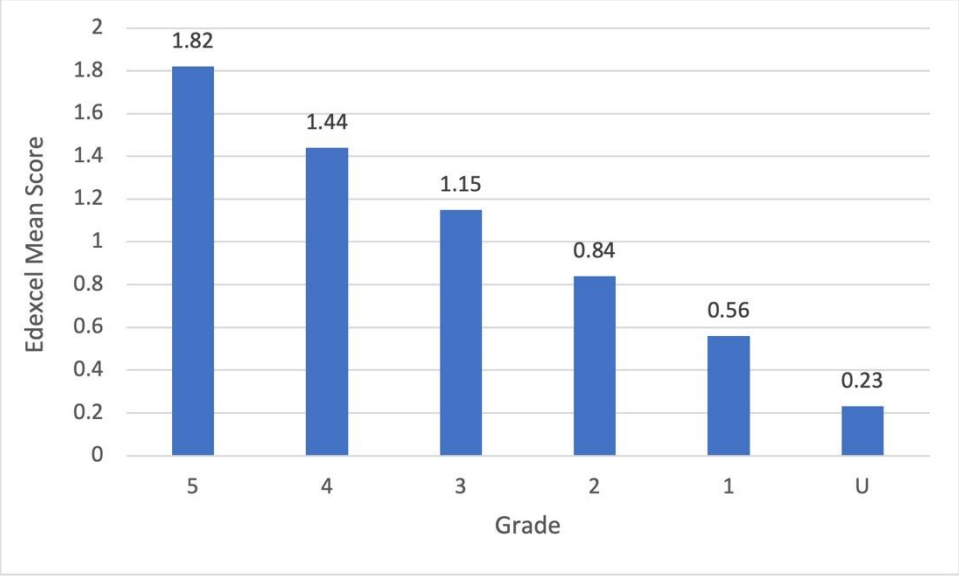
A significant number of students attempted to solve the equation using trial and error rather than algebraic methods. This approach scores either full marks or zero marks and should not be encouraged.

In part (c), responses were encouraging. Students demonstrated a good understanding of how to write the expression $3x + 2y$ correctly, with again almost half of the cohort scoring full marks.

Where candidates failed to gain full marks, some gained one for having one of the terms correct but most failed to score at all. Often this was due to using powers or a subtraction sign or even missing the sign altogether.

Question 14c - Performance

Mean score	Max score	Mean %	Edexcel averages: mean scored by candidates achieving grade:						
			ALL	5	4	3	2	1	U
1.11	2	56	1.11	1.82	1.44	1.15	0.84	0.56	0.23



Question 14c- Response A

There are x sweets in a box.

There are y sweets in a packet.

(c) Write an expression, in terms of x and y, for the total number of sweets in 3 boxes and 2 packets.

$2y+3x$

(2)

2 /2

M1 for $2y$ or $3x$
A1 the answer is fully correct and the order is not important so the accuracy mark can be awarded.

Question 14c - Response B

There are x sweets in a box.

There are y sweets in a packet.

(c) Write an expression, in terms of x and y, for the total number of sweets in 3 boxes and 2 packets.

$x \times 3 = y \times 2$

(2)

1 /2

M1 for either expression $x\times3$ or $y\times2$
A0 the candidate uses an equal sign instead of addition.

Question 14c - Response C

There are x sweets in a box.

There are y sweets in a packet.

m = 7

(c) Write an expression, in terms of x and y, for the total number of sweets in 3 boxes and 2 packets.

3x and 2y

(2)

1 /2

Q14c

M1 for either $3x$ or $2y$
A0 the answer is incorrect, 'and' is not a mathematical symbol and + is required for a fully correct answer.

NB m = 7 is from another question and does not affect the marking for the expression.

Question 16

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

Question 16 - Question

16 Water flows through each of the pipes that fill a lake at the same rate.
It takes 4 of the pipes 12 hours to fill the lake.

Work out how many hours it would take 6 pipes to fill $\frac{1}{4}$ of the lake.

..... hours

(Total for Question 16 is 3 marks)

Question 16 - Mark Scheme

Question	Answer	Mark	Mark scheme	Additional guidance
16	2	P1	for a calculation from within the list 4 × 12 ÷ 4 ÷ 6 eg 4 × 12 (= 48) or 12 ÷ 4 (= 3) or 6 ÷ 4 (=1.5) or 4 ÷ 6 (= 0.66..)	
		P1	for a complete process, eg ("48" ÷ 6) ÷ 4 **or** for "$0.\dot{6}$" × 12 ÷ 4	Accept 12 ÷ 6 as a full process
		A1	cao	

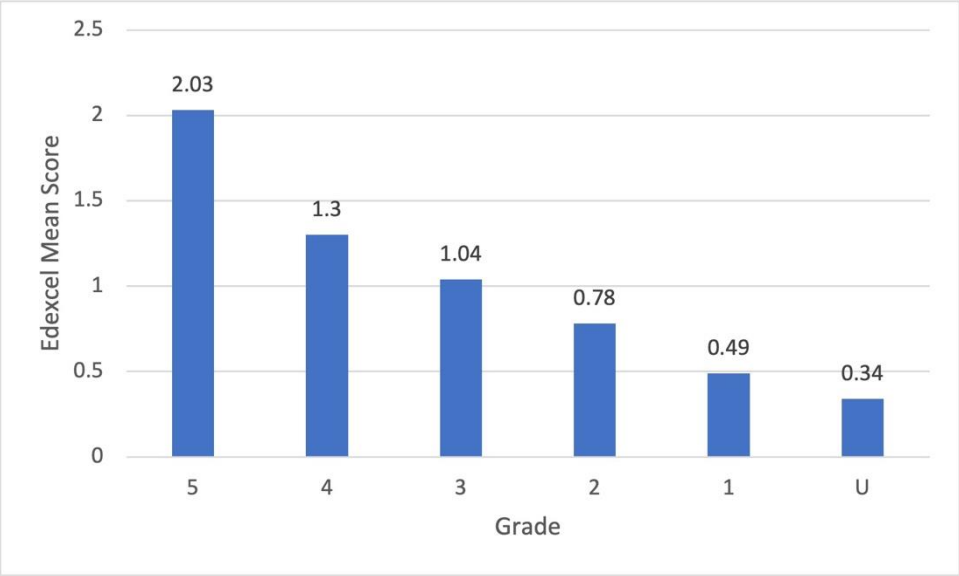
Question 16 - Examiner Comments

Most students gained only 1 mark for an appropriate step to the process, most commonly from 12 divided by 4, but their answers broke down frequently applying direct proportion rather than inverse.

It was also common to see several approaches for this question. From the scripts seen it was clear that students found this question challenging. Going forward students are advised that checking the response to see if it is sensible is a good strategy: "Do we expect a larger or smaller numerical answer?" this will assist the students in dismissing incorrect working and selecting the correct operations needed.

Question 16 - Performance

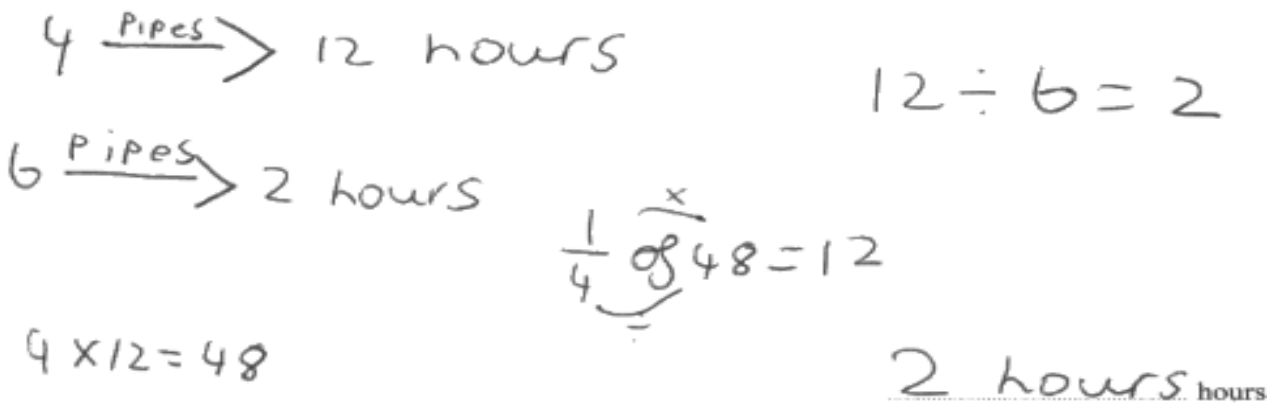
Mean score	Max score	Mean %	Edexcel averages: mean scored by candidates achieving grade:						
			ALL	5	4	3	2	1	U
1.02	3	34	1.02	2.03	1.30	1.04	0.78	0.49	0.34



Question 16 - Response A

Water flows through each of the pipes that fill a lake at the same rate.
It takes 4 of the pipes 12 hours to fill the lake.

Work out how many hours it would take 6 pipes to fill $\frac{1}{4}$ of the lake.



3 /3

P1 for a correct first step.
P1 for fully correct processes seen.
A1: correct answer.

Question 16 - Response B

Water flows through each of the pipes that fill a lake at the same rate.
It takes 4 of the pipes 12 hours to fill the lake.

Work out how many hours it would take 6 pipes to fill $\frac{1}{4}$ of the lake.

4 x 12 = 48

$\frac{1}{4}$ of 48 = 12

12 ÷ 6 = 3

3 hours

2 /3

P1 for 4 multiplied by 12
P1 for a fully correct process with an arithmetic error made in the last line of working.
A0: incorrect answer.

Question 16 - Response C

Water flows through each of the pipes that fill a lake at the same rate.
It takes 4 of the pipes 12 hours to fill the lake.

Work out how many hours it would take 6 pipes to fill $\frac{1}{4}$ of the lake.

4 x 12 hours = 48

6 pipes to fill $\frac{1}{4}$ of the lake.

$\frac{1}{4}$ of 48 = 12 x 1 = 12 x 6 = 72 hours

72 hours

1 /3

Q16

P1 correct first step arriving at 48, but the process is sufficient for the mark.

The next part is correct but 12 × 6 is incorrect so we cannot give the full process mark.

P0A0: The answer is incorrect

Question 19

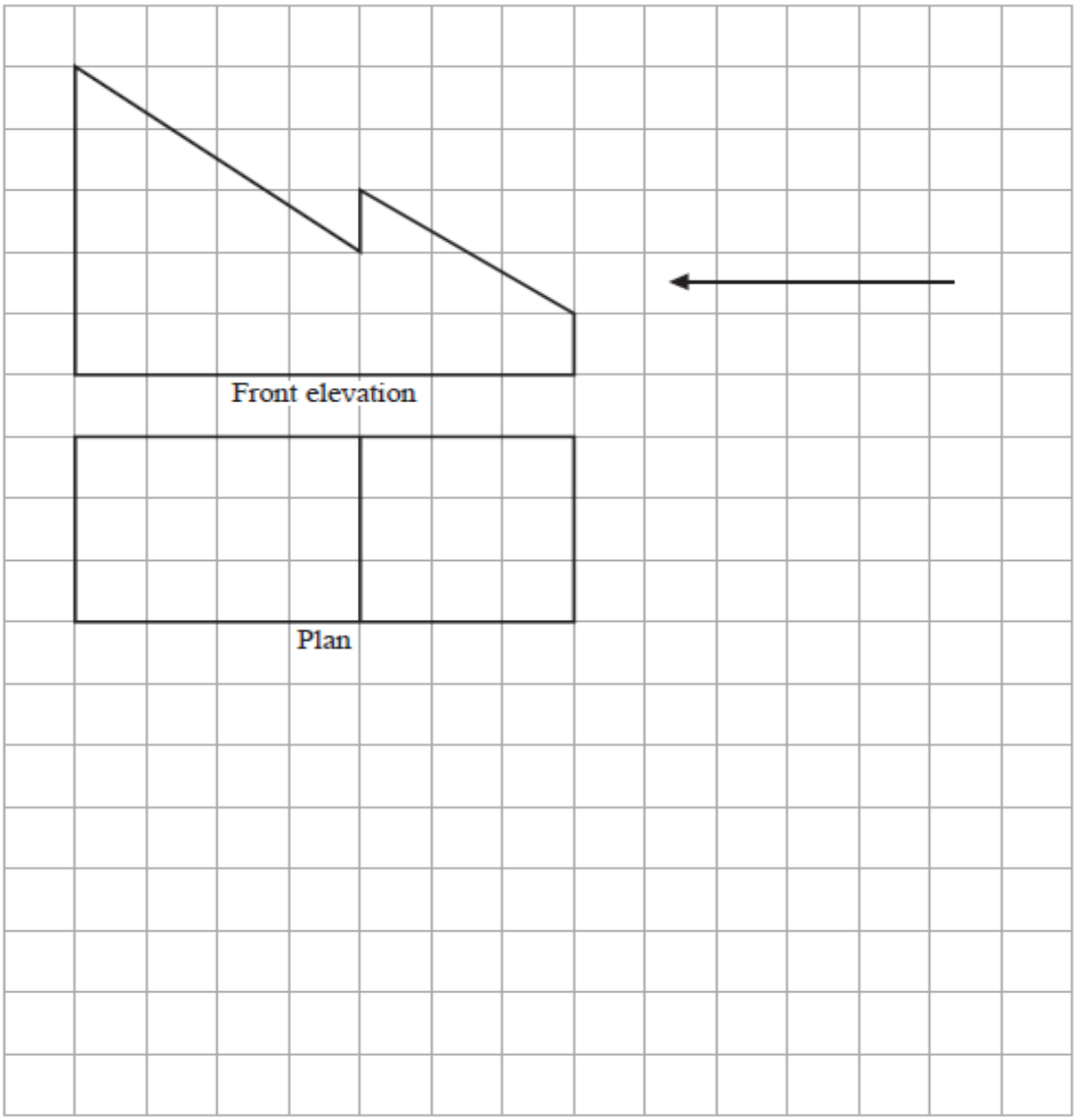
Question | Mark Scheme | Examiner Comments

Performance | Response A | Response B | Response C

Question 19 - Question

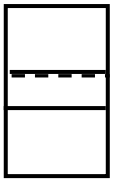
19 The front elevation and the plan of a solid are shown on the grid.

On the grid, draw the side elevation of the solid from the direction of the arrow.



(Total for Question 19 is 2 marks)

Question 19 - Mark Scheme

Question	Answer	Mark	Mark scheme	Additional guidance
19	Elevation	B2 (B1	fully correct side elevation 5 high and 3 wide for a rectangle 5 high and 3 wide or correct side elevation in the wrong orientation)	

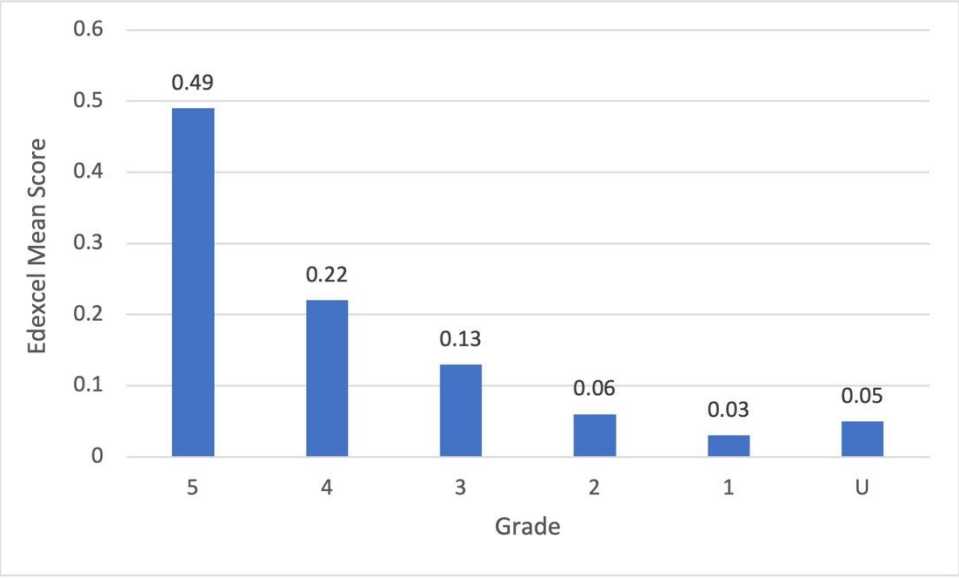
Question 19- Examiner Comments

This question was not well answered and very few full marks were awarded. A proportion of students gained 1 mark for a correct 5 by 3 rectangle drawn in the correct orientation; attempts to draw the horizontal lines to indicate features on the shape were rare. Even rarer was the use of the dashed line to indicate the hidden feature.

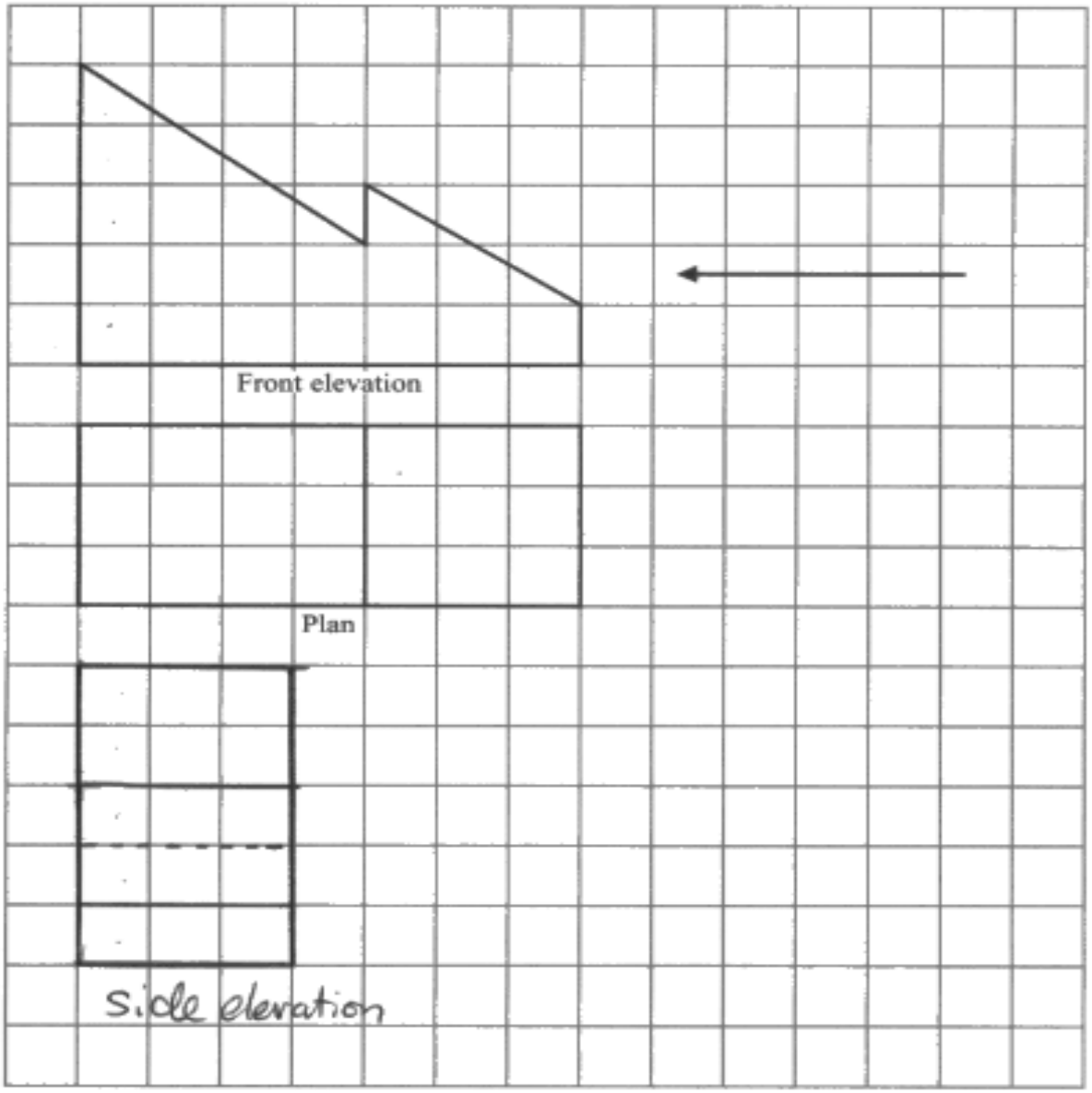
This is an area of the specification students seem to find challenging and centres are advised to look at plans and elevations with students, emphasising the need for the internal lines.

Question 19 - Performance

Mean score	Max score	Mean %	Edexcel averages: mean scored by candidates achieving grade:						
			ALL	5	4	3	2	1	U
0.13	2	7	0.13	0.49	0.22	0.13	0.06	0.03	0.05



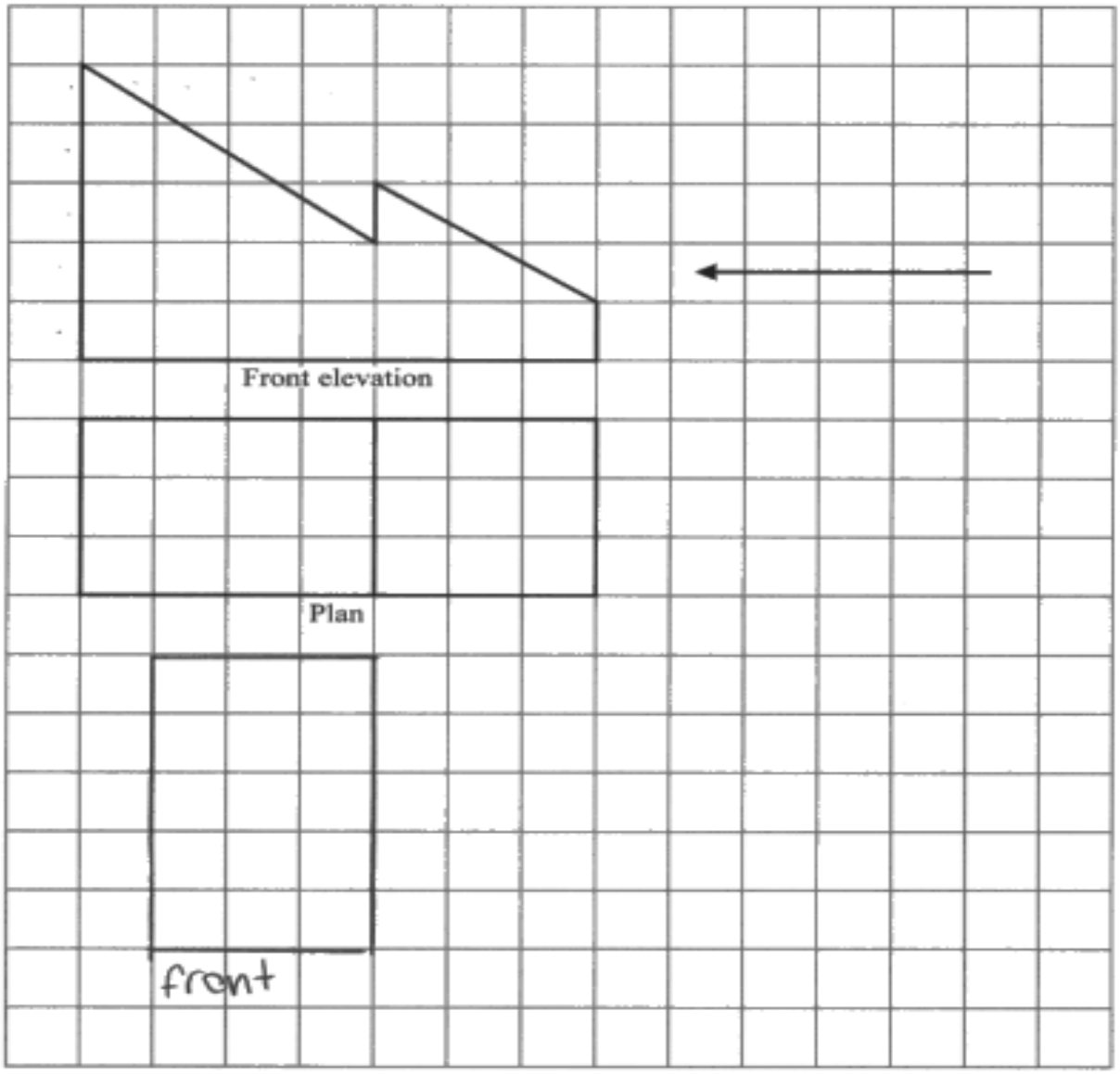
Question 19 - Response A



2 /2

B2 for a fully correct side elevation.

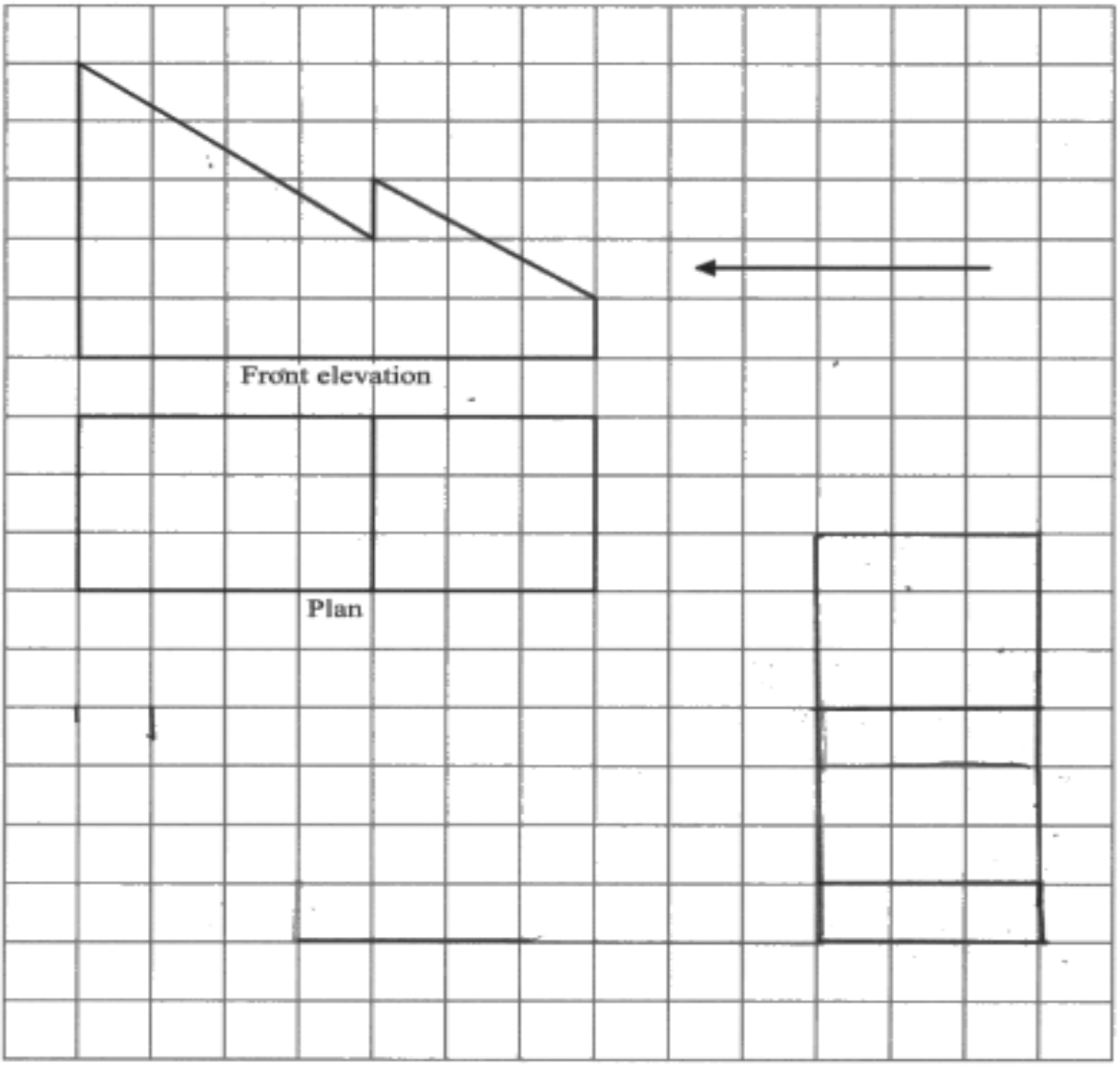
Question 19 - Response B



1 /2

B1 can be awarded for a rectangle of 3 by 5 is seen but no dividing lines are shown.

Question 19 - Response C



0 /2

B0 as this rectangle is too tall.

Question 20b

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

Question 20b - Question

20. The nth term of a different sequence is $8 - 6n$

(b) Is −58 a term of this sequence?
You must show how you get your answer.

(2)

(Total for Question 20 is 4 marks)

Question 20b - Mark Scheme

Question	Answer	Mark	Mark scheme	Additional guidance
20 (b)	Shown with supportive working	M1	for $8 - 6n = -58$ or $8 - 6 \times 11 (= -58)$ **or** starts to list terms of the sequence, with at least 3 correct or any other valid method.	2, −4, −10, −16, −22, −28, −34, −40, −46, −52
		A1	shown with working or an explanation , eg Yes and 11 or 2, –4, –10, –16, ..., –52, –58	May stop at −58 or ring if sequence continues

Question 20b - Examiner Comments

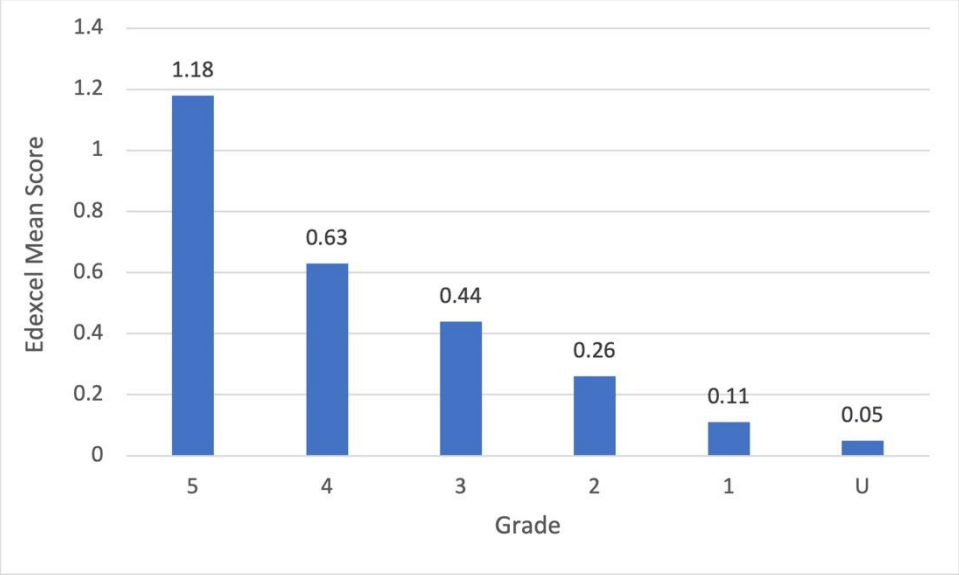
For part (a) students had mixed success finding the nth term, with almost equal numbers gaining either 0 or 2 marks. Errors made were finding the common difference but not recognising this as $6n$ and stated a response of $n + 6$ or $6 - n$.

Those students who identified $6n$ sometimes paired it with -1 instead of $+1$ or put $6n + 7$ or left as $6n$. A common incorrect answer was $7 - 6n$ which gained no credit.

In part (b) some students were successful in listing the terms of the sequence. But a common listing error was to start with 6 and subtract 8, rather than the other way around.
There were very few attempts to set up and solve an equation. Those that set up the equation $8 - 6n = -58$ were then unable to successfully show that n was 11 as many arithmetic errors occurred.
Centres should ensure that students practising creating equations and solving them, especially involving negative numbers.

Question 20b - Performance

Mean score	Max score	Mean %	Edexcel averages: mean scored by candidates achieving grade:						
			ALL	5	4	3	2	1	U
0.43	2	22	0.43	1.18	0.63	0.44	0.26	0.11	0.05

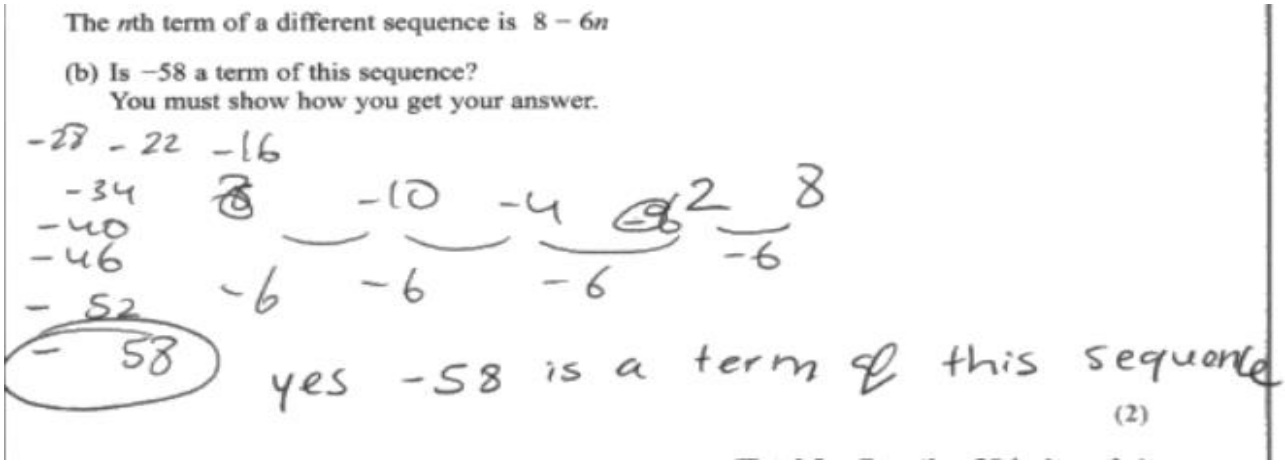


Q20b

Question 20b - Response A

The nth term of a different sequence is $8 - 6n$

(b) Is -58 a term of this sequence?
You must show how you get your answer.



2 /2

Q20b

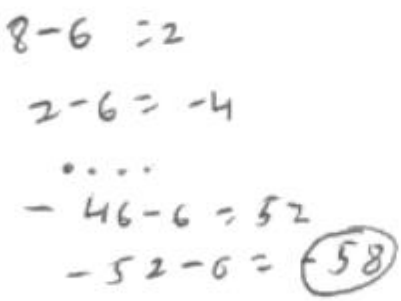
M1 the correct sequence is written out to show that -58 is a term in the sequence.
Starting at 8 and working backwards is acceptable.

A1 there is a correct decision and supportive evidence.

Question 20b - Response B

The nth term of a different sequence is $8 - 6n$

(b) Is -58 a term of this sequence?
You must show how you get your answer. No



(2)

1 /2

M1 for writing out the sequence, with enough terms shown.
A0 the decision is incorrect.

Question 20b - Response C

The nth term of a different sequence is $8 - 6n$

(b) Is -58 a term of this sequence?
You must show how you get your answer.

$8 - 6n = -58$

$+8$ $+8$

$-2n = -58$

$\div -2$ $\div -2$

$n = 0.34$

no it is not in the sequence.

(2)

(Total for Question 20 is 4 marks)

1 /2

M1 the candidate sets up the correct equation, unfortunately they cannot solve it correctly.
A0: incorrect solution and decision.

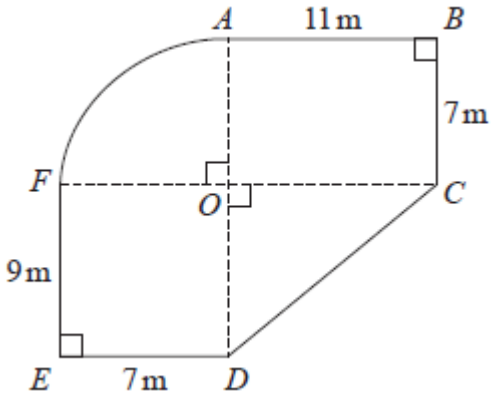
Question 21

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

Question 21 - Question

21 The diagram shows a plan of Jason's garden.

ABCO and *DEFO* are rectangles.
CDO is a right-angled triangle.
AFO is a sector of a circle with centre *O* and angle *AOF* = 90°



Jason is going to cover his garden with grass seed.
Each bag of grass seed covers 14 m^2 of garden.
Each bag of grass seed costs £10.95

Work out how much it will cost Jason to buy all the bags of grass seed he needs.

£.....

(Total for Question 21 is 5 marks)

Question 21 - Mark Scheme

Question	Answer	Mark	Mark scheme	Additional guidance
21	186.15	P1	for correctly finding the area of at least three sections, eg 3 of 11×7 (= 77), **or** 9×7 (= 63), **or** $\frac{1}{2} \times 11 \times 9$ (= 49.5), **or** $\frac{1}{4} \times \pi \times 7^2$ (= 38.4845..)	Note a trapezium for the rectangle and triangle should be classed as two areas. Accept figures rounded or truncated to 1 dp or better throughout.
		P1	for a method to find the number of bags required for one area or a combination of areas eg "77" ÷ 14 (= 5.5) **or** "227.9845.." ÷ 14 (= 16.2846…)	
		P1	for method to work out the total area for all four sections eg "77" + "63" + "49.5" + "38.4845…" (= 227.9845…) or adding the exact number of bags per section for all four sections eg "5.5" + "4.5" + "3.53.." + "2.74.." (= 16.28...)	This mark is dependent upon correct processes seen for all four sections.
		P1	for method to find the cost, eg integer number of bags × 10.95	integer number of bags must come from area ÷ 14 rounded up
		A1	cao	

Question 21 - Examiner Comments

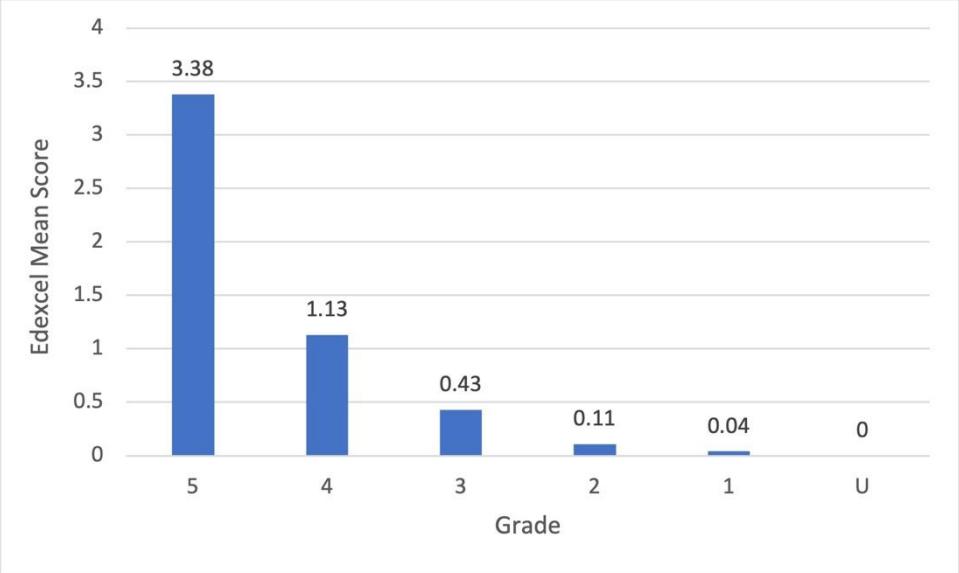
The majority of students found this multistage problem involving area, proportion and cost challenging, with a wide range of approaches and very few fully correct responses seen. Whilst many students were able to correctly calculate the area of the rectangular sections of the composite shape, very few were able to use the appropriate formulae for the area of a triangle and a circle to find the total area. Of those that did recall the formulae correctly, some used an incorrect dimension for the triangle by using 7cm instead of 9cm and some forgot to divide the area of the circle by 4 to find the area of the quadrant. It was also common to see areas of at least one rectangle being combined with angles of 90°, 180° or 360° for the circular area.

The use of proportion to work out the number of bags needed to cover the area calculated was used correctly by some students, with many gaining a mark for finding the number of bags required to cover at least one correct area. These students often went on correctly to round the number of bags needed to an integer before multiplying by the cost of a single bag to gain another mark. A small number of students didn't round up and therefore gained no credit for finding the cost using part bags.

Students who were the most successful often showed working in a systematic way by splitting the shape into 4 sections before continuing with their calculations. It is important for students to be able to fully recall correct formulae for the areas of a number of shapes and the use of systematic working helped students work through this multistep question.

Question 21- Performance

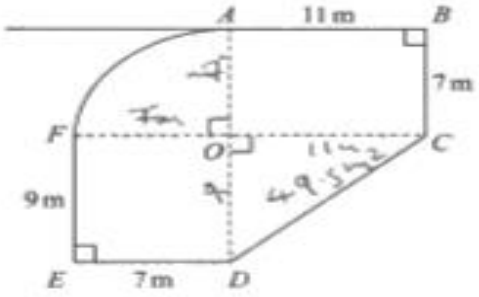
Mean score	Max score	Mean %	Edexcel averages: mean scored by candidates achieving grade:						
			ALL	5	4	3	2	1	U
0.54	5	11	0.54	3.38	1.13	0.43	0.11	0.04	0.00



Question 21 - Response A

21 The diagram shows a plan of Jason's garden.

ABCO and *DEFO* are rectangles.
CDO is a right-angled triangle.
AFO is a sector of a circle with centre *O* and angle *AOF* = 90°



Jason is going to cover his garden with grass seed.
Each bag of grass seed covers 14 m² of garden.
Each bag of grass seed costs £10.95

Work out how much it will cost Jason to buy all the bags of grass seed he needs.

DOC = 9 × 11 ÷ 2
= 99 ÷ 2
= 49.5 m²

ABCO = 11 × 7
= 77 m²

FEDO = 9 × 7
= 63 m²

FOA = π × r² ÷ 4
= 153.93 m² ÷ 4
= 38.48
= 38.5

= 228 m²
228 ÷ 14
= 16.3 → 17
= 186.15

£ 186.15

5 /5

Q21

A
B
C

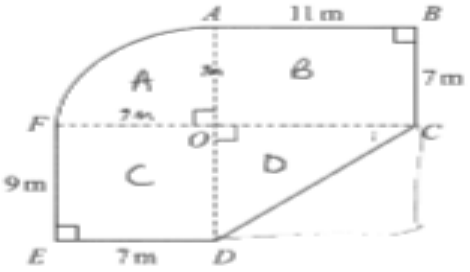
P1 for three correct areas calculated, in this case all 4 are correct.
P1 for adding all 4 areas together.
P1 for taking the total area and dividing by 14.
P1 for rounding their answer and using 17 to work out the cost.
A1 for the correct answer.

Question 21 - Response B

21 The diagram shows a plan of Jason's garden.

ABCO and *DEFO* are rectangles.
CDO is a right-angled triangle.
AFO is a sector of a circle with centre *O* and angle *AOF* = 90°

Cherry $\pi \times d$
Apple πr^2



$b \times H \div \frac{1}{2} =$

Jason is going to cover his garden with grass seed.
Each bag of grass seed covers 14 m² of garden.
Each bag of grass seed costs £10.95

Work out how much it will cost Jason to buy all the bags of grass seed he needs.

B = 11m × 7m = 77m²
C = 9m × 7m = 63m²
A = π × 7² = 49π
√49 = 7m²
D = B × H ÷ 2 =
11m × 9m = 99m² ÷ 2 = 49.5m²

77m² ÷ 14m² = 30.25m²
63m² ÷ 14m² = 20.25m²
7m² ÷ 14m² = 0.25m²
49.5m² − 14m² = 12.5m²
63.25 bags

(B) (E) (A) (D)
77m² + 63m² + 7m² + 49.5m² = 12397.25m²
12397.25m² ÷ 14m² = 784141.8753
784142m²
784142 × £10.95 = £8586354.9
round 63.25 to 64 bags
64 × £10.95 = £700.80

£700.80

Q21

3 /5

P1 Three areas are correctly shown
P1 Each area is divided by 14 so we can award P1.
Note: one area divided by 14 is enough and here the answers are incorrect but the processes are shown.

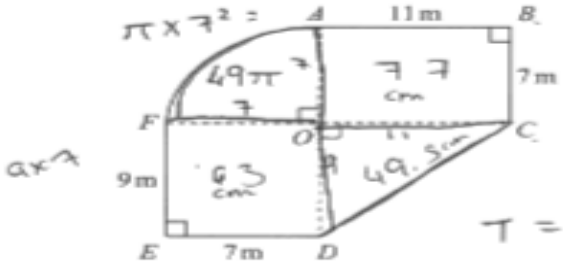
P0 for the process to add the areas divided by 14, as the circle area is an incorrect process.
P1 Their answer for areas divided by 14 is rounded to 64 and this is used to find the cost P1 can be awarded.

A0 as the answer is incorrect

Question 21 - Response C

21 The diagram shows a plan of Jason's garden.

ABCO and *DEFO* are rectangles.
CDO is a right-angled triangle.
AFO is a sector of a circle with centre *O* and angle *AOF* = 90°



Jason is going to cover his garden with grass seed.
Each bag of grass seed covers 14 m² of garden.
Each bag of grass seed costs £10.95

Work out how much it will cost Jason to buy all the bags of grass seed he needs.

$77 + 63 + 49.3 + 49\pi = 343.843804$

$34.34 \times 10.95 = 376.0646538$

£376.06

1 /5

P1 processes for three areas are seen
P0 no division by 14 is attempted.
P0 the addition is not for 4 areas from correct processes.
P0 the cost calculation is not using a rounded valid value.
A0 the answer is incorrect.

Q21

A
B
C

Question 23

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

Question 23 - Question

23 Ella invests £7000 for 2 years in an account paying compound interest.

In the first year, the rate of interest is 3%
In the second year, the rate of interest is 1.5%

Work out the value of Ella's investment at the end of 2 years.

£.....

(Total for Question 23 is 3 marks)

Question 23 - Mark Scheme

Question	Answer	Mark	Mark scheme	Additional guidance
23	7318.15	M1	for a correct first step eg working out increase for one year 7000 × (100 + 3) ÷ 100 (= 7210) oe **or** 7000 × 3 ÷ 100 (= 210) oe **or** find the multiplier for both years eg (100 + 3) ÷ 100 × (100 + 1.5) ÷ 100 (=1.04545)	7315 or 315 implies M1
		M1	for a compound method, eg 7000 × (100 + 3) ÷ 100 × (100 + 1.5) ÷ 100 oe **or** "7210" × 1.5 ÷ 100 or (= 108.15) oe	318.15 implies M1M1A0
		A1	cao	

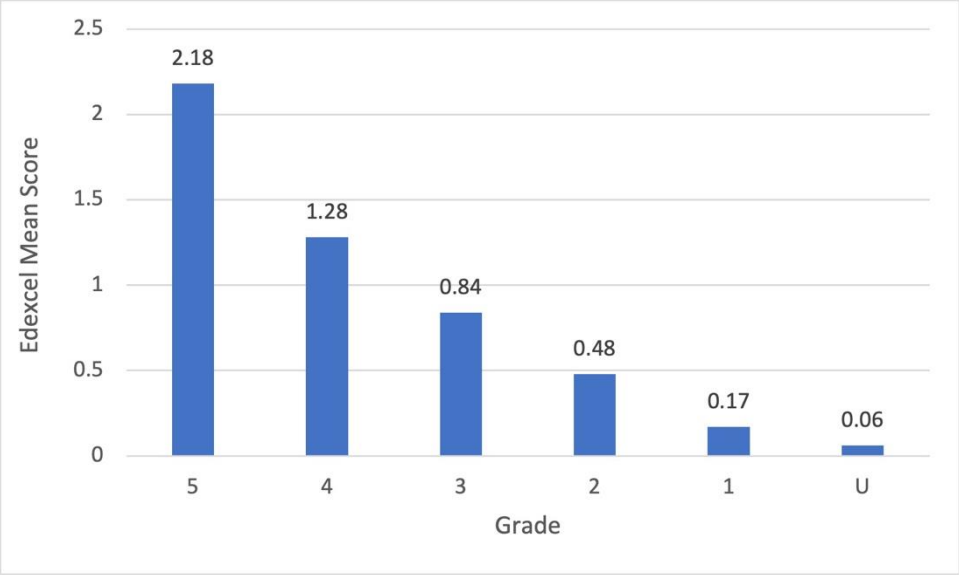
Question 23 - Examiner Comments

This question required students to calculate with compound interest and a mark was often awarded for calculating the interest for a single year but many did not add this amount on before working with the interest rate for the second year and instead used the starting value of £7000 for both rates before adding the values together. A small minority of students used the second interest rate of 1.5% for 2 years instead of one year.

It was also disappointing to see some students using written calculations to find their answer and practice using a calculator to answer this type of question would be beneficial to students.

Question 23 - Performance

Mean score	Max score	Mean %	Edexcel averages: mean scored by candidates achieving grade:						
			ALL	5	4	3	2	1	U
0.84	3	28	0.84	2.18	1.28	0.84	0.48	0.17	0.06



Question 23 - Response A

Ella invests £7000 for 2 years in an account paying compound interest.

In the first year, the rate of interest is 3%
In the second year, the rate of interest is 1.5%

Work out the value of Ella's investment at the end of 2 years.

$7000\left(1+\frac{3}{100}\right)^1 = 7210$

$7210\left(1+\frac{1.5}{100}\right)^1 = 7318.15$

£ 7318.15

3 /3

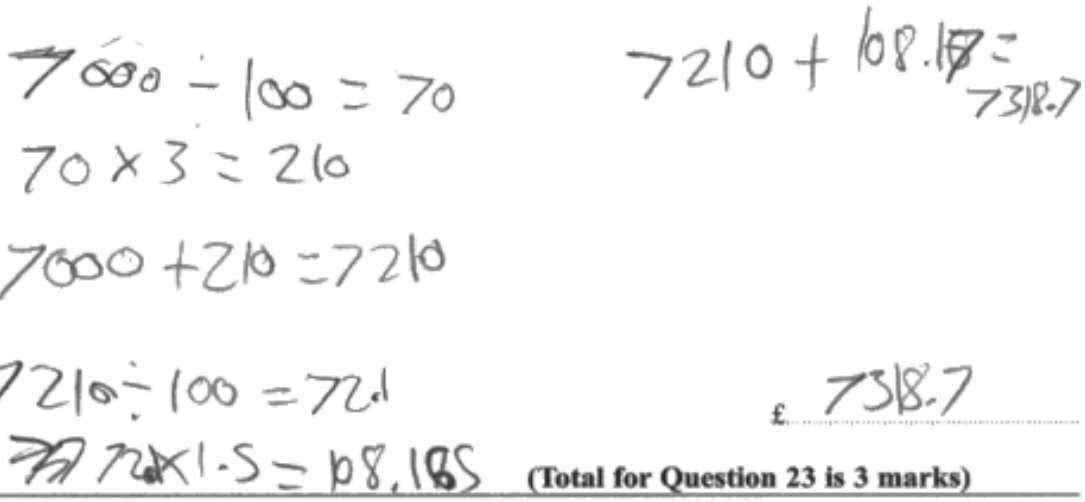
M1 for a correct first step, here we have the process written out in full and the answer of 7210 given.
M1 for using a compound method, 7210 is used and again the correct process is shown.
A1 The answer is accurate so A1 should be awarded.

Question 23 - Response B

Ella invests £7000 for 2 years in an account paying compound interest.

In the first year, the rate of interest is 3%
In the second year, the rate of interest is 1.5%

Work out the value of Ella's investment at the end of 2 years.



(Total for Question 23 is 3 marks)

2 /3

M1 3% of 7000 is calculated and is a valid first step.
M1 for a compound method seen, the process is shown but we have an arithmetic error when multiplying by 1.5 so the answer is incorrect award **A0**

Question 23 - Response C

23 Ella invests £7000 for 2 years in an account paying compound interest.

In the first year, the rate of interest is 3%
In the second year, the rate of interest is 1.5%

Work out the value of Ella's investment at the end of 2 years.

3% of 7000 = £210

1.5% of 7000 = £105

1% = 70
0.5% = 35

210 + 105 = 315

10% = 700
5% = 350
1% = 70
3% = 210

70 + 35 = 105

7000 + 315 = 7315

£ 7315

(Total for Question 23 is 3 marks)

1 /3

M1 for 3% of 7000 =210, the figure is accurate and so is enough for the mark BUT if the full process is not shown then all figures stated must be correct.
M0 there is no attempt to use a compound method and so this mark cannot be awarded.
A0 the answer is incorrect.