

GCSE (9–1)

Exemplar Candidate Work

MATHEMATICS

J560

For first teaching in 2015

J560/01 Summer 2019 examination series

Version 1

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Introduction

These exemplar answers have been chosen from the summer 2019 examination series.

OCR is open to a wide variety of approaches and all answers are considered on their merits. These exemplars, therefore, should not be seen as the only way to answer questions but they do illustrate how the mark scheme has been applied.

Please always refer to the specification <https://www.ocr.org.uk/Images/168982-specification-gcse-mathematics-j560.pdf> for full details of the assessment for this qualification. These exemplar answers should also be read in conjunction with the sample assessment materials and the June 2019 Examiners' report or Report to Centres available from Interchange <https://interchange.ocr.org.uk/>.

The question paper, mark scheme and any resource booklet(s) will be available on the OCR website from summer 2020. Until then, they are available on OCR Interchange (school exams officers will have a login for this and are able to set up teachers with specific logins – see the following link for further information <http://www.ocr.org.uk/administration/support-and-tools/interchange/managing-user-accounts/>).

It is important to note that approaches to question setting and marking will remain consistent. At the same time OCR reviews all its qualifications annually and may make small adjustments to improve the performance of its assessments. We will let you know of any substantive changes.

Question 2(b)

2 (b) Show that 55 is **not** a square number.

[2]

Exemplar 1

1 mark

$$1 \times 1 = 1 \quad 2 \times 2 = 4 \quad 3 \times 3 = 9 \quad 4 \times 4 = 16 \quad 5 \times 5 = 25$$

$$6 \times 6 = 36 \quad 7 \times 7 = 49 \quad 8 \times 8 = 64$$

Examiner commentary

This candidate scores 1 mark for showing 49 and 64.

To score full marks the candidate needed to explain that 55 is between 49 and 64 so it cannot be a square number.

Question 3

3 Complete this table of fractions, decimals and percentages.

[3]

Exemplar 1

2 marks

Fraction		Decimal		Percentage
$\frac{1}{4}$	=	0.25	=	25%
$\frac{7}{100}$	=	0.07	=	7%
$\frac{13}{100}$	=	1.3	=	130%

$$\frac{1.3}{10}$$

[3]

Examiner commentary

Many candidates were able to correctly complete the first 2 lines, as shown in this exemplar. $\frac{13}{100}$ was a common error.

Another common error was to write 70, rather than 7%.

Question 5 (a)

5 Lev (L), Maria (M) and Nicholas (N) sit in a row of three seats.

- (a) Use the table to list all the different orders in which they could sit.
One possible order is already shown in the table.
You may not need to use all the rows in the table.

[2]

Exemplar 1

1 mark

Seat 1	Seat 2	Seat 3
L	M	N
M	E N	L
N	L	M
N	L	M
M	L	N

[2]

Examiner commentary

In this exemplar, the option L, N, M has not been given so the candidate scores 1 mark.

Candidates should be encouraged to list answers in a systematic way in order to reduce errors and omissions.

Question 7

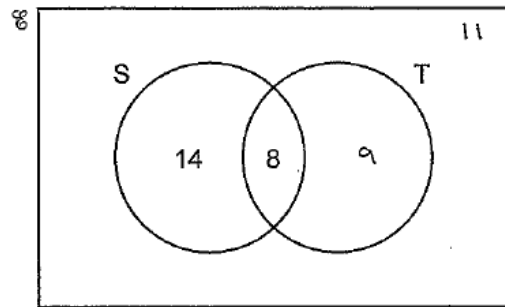
7 A survey asked whether some students went swimming (S) or played tennis (T) last month.

- 17 played tennis.
- 11 did not go swimming and did not play tennis.
- 22 went swimming.
- 8 went swimming and played tennis.

Some of this information is shown on the Venn diagram below.

Exemplar 1

3 marks



$$14 + 8 = 22$$

$$17 - 8 = 9$$

How many students were in the survey?

$$14 + 8 + 9 + 11 = 42$$

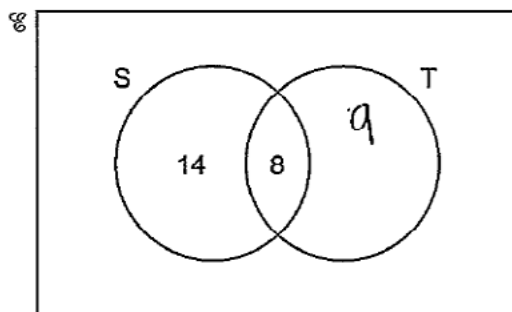
..... = 42 [3]

Examiner commentary

This exemplar shows a correct answer with full working shown.

Exemplar 2

1 mark



How many students were in the survey?

$$17 + 11 + 22 + 8 = 58$$

~~$$14 + 8 + 9 = 31$$~~

~~58~~

..... [3]

Examiner commentary

Many candidates did not fully understand Venn diagrams, as shown in this exemplar. This candidate has correctly found the number of students who play tennis only and scored 1 mark. They then made an error when calculating the number of students and included 8 in their addition twice. This was a common misconception.

Question 8

- 8 Kim is paid £9.40 per hour for the first 35 hours she works each week. After 35 hours she is paid at one and a quarter times the hourly rate.

One week Kim works 42 hours.

Calculate how much she is paid for that week.

£ [6]

Exemplar 1

6 marks

$$9.40 \times 35 = £329 = (\text{first 35 hours}).$$

$$1\frac{1}{4} \text{ of } 9.40 =$$

$$11.75 = \text{hourly rate.}$$

$$\frac{1}{4} = £2.35$$

$$\begin{array}{r} 42 \\ -35 \\ \hline 7 \end{array}$$

$$11.75 \times 7 = 82.25.$$

$$1 = \underline{9.40} = +$$

$$329 + 82.25 = 411.25$$

$$£11.75.$$

£ 411.25 [6]

Examiner commentary

Many candidates scored full marks on this question. This is shown in this well-presented response where correct logical working leads to the correct answer.

Candidates need to be encouraged to show their working clearly.

Exemplar 2

1 mark

- 8 Kim is paid £9.40 per hour for the first 35 hours she works each week. After 35 hours she is paid at one and a quarter times the hourly rate.

One week Kim works 42 hours.

Calculate how much she is paid for that week.

$$\begin{aligned} \text{£}9.40 \times 35 &= \text{£}329 \text{ for each week payed.} \\ 1\frac{1}{4} \times 9.40 &= \text{£}11.75 \end{aligned}$$

$$\begin{array}{l} \div 35 \quad 35 \text{ hours} \Rightarrow \text{£}329 \\ \quad 1 \text{ hour} - \text{£}9.40 \quad \left. \vphantom{\begin{array}{l} \div 35 \\ \quad 1 \text{ hour} - \text{£}9.40 \end{array}} \right\} \div 35 \\ \times 42 \text{ hours } 42 \text{ hours} = \text{£}394.80 \quad \times 42 \end{array}$$

£ 394.80 [6]

Examiner commentary

This candidate has used 2 methods, giving the examiner a choice. The method which leads to the answer on the answer line is the method which is marked. They score 1 mark for 9.40 (given in the question) multiplied by 42. No further progress is made.

Question 9

9 Mike drinks $\frac{2}{5}$ of a litre of juice each day.
 Juice costs £4.40 for a 2 litre carton and £2.60 for a 1 litre carton.
 Mike buys enough juice to last for 7 days.
 What is the lowest price Mike can pay for this juice?
 Show how you decide.

£ [4]

Exemplar 1

3 marks

9 Mike drinks $\frac{2}{5}$ of a litre of juice each day.
 Juice costs £4.40 for a 2 litre carton and £2.60 for a 1 litre carton.
 Mike buys enough juice to last for 7 days.
 What is the lowest price Mike can pay for this juice?
 Show how you decide.

Handwritten notes:
 $\frac{2}{5} = 0.4$
 1 litre - 2 portions + some spare $\frac{1}{2}$ (2 days)
 1 litre - 2 portions + $\frac{1}{2}$ (4 days)
 1 litre - 2 parts = $\frac{1}{2}$ (7 days)

$2.60 \times 2 = \underline{\underline{5.2}}$

$2.60 \times 3 = \underline{\underline{7.8}}$
 $4.40 + 2.60 = \underline{\underline{7}}$

need 3 litres

£ 7 [4]

Examiner commentary

The candidate has shown working and their answer of £7 is correct. However, they have not shown that buying 4 litres (2 x 2 litre cartons) would cost £8.80 and therefore have not shown that £7 is the cheapest option. The candidate earned three marks.

Exemplar 2**2 marks**

$$\frac{2}{5} = \text{each day} \quad \frac{2}{5} \times 7 = \frac{14}{5} \quad 2^4 \quad \underline{2.8}$$

$$\frac{14}{5} = 2 \frac{4}{5}$$

$$\begin{array}{r} 4.40 \\ 2.60 \\ \hline 7.00 \\ 1 \end{array}$$

£ 7 [4]

Examiner commentary

This candidate has correctly calculated that 2.8 litres of juice are needed and that they have to buy 3 litres. This earns the first M1 mark. They correctly calculate the price for a 2 litre and a 1 litre carton, but do not consider any other combinations of buying at least 3 litres of juice. They are awarded the B1 mark for an answer of 7.

Candidates should ensure that they read each question carefully, and fully understand what they are being asked to do.

Question 10

10 Mr and Mrs Wilde have five children who are all **different** ages.

- The mean age is 6.4.
- The range is 9.
- The median is 6.
- The oldest child is 12.

Work out the ages of the children.
Write their ages from youngest to oldest.

.....
youngest oldest
[4]

Exemplar 1

3 marks

10 Mr and Mrs Wilde have five children who are all **different** ages.

- The mean age is 6.4. add all ÷ how many
- The range is 9.
- The median is 6.
- The oldest child is 12.

Work out the ages of the children.
Write their ages from youngest to oldest.

$3, 5, 6, 6, 12$
 $32 \div 5 = \underline{6.4}$
 range
 $12 - 3 = 9$

smallest
/youngest

3, 5, 6, 6, 12 oldest

.....
3 5 6 6 12
youngest oldest
[4]

Examiner commentary

The candidate has correctly placed both 6 and 12 in the correct position, either of these would have scored the first mark. They have used the range to calculate the youngest child as 3 for the second mark. They also score the third mark for their 2nd and 4th ages adding to 11. This is a classic case of not reading the question carefully as the stem clearly states that the children are different ages.

Exemplar 2

1 mark

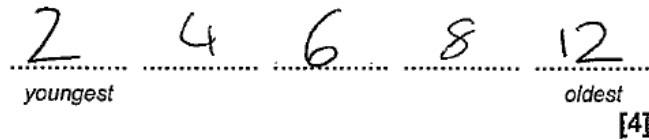
10 Mr and Mrs Wilde have five children who are all different ages.

- The mean age is 6.4.
- The range is 9.
- The median is 6.
- The oldest child is 12.

*Median is the middle
Add each division the
mean.*

Work out the ages of the children.
Write their ages from youngest to oldest.

$$12 + 6 + 2 = 20$$



Examiner commentary

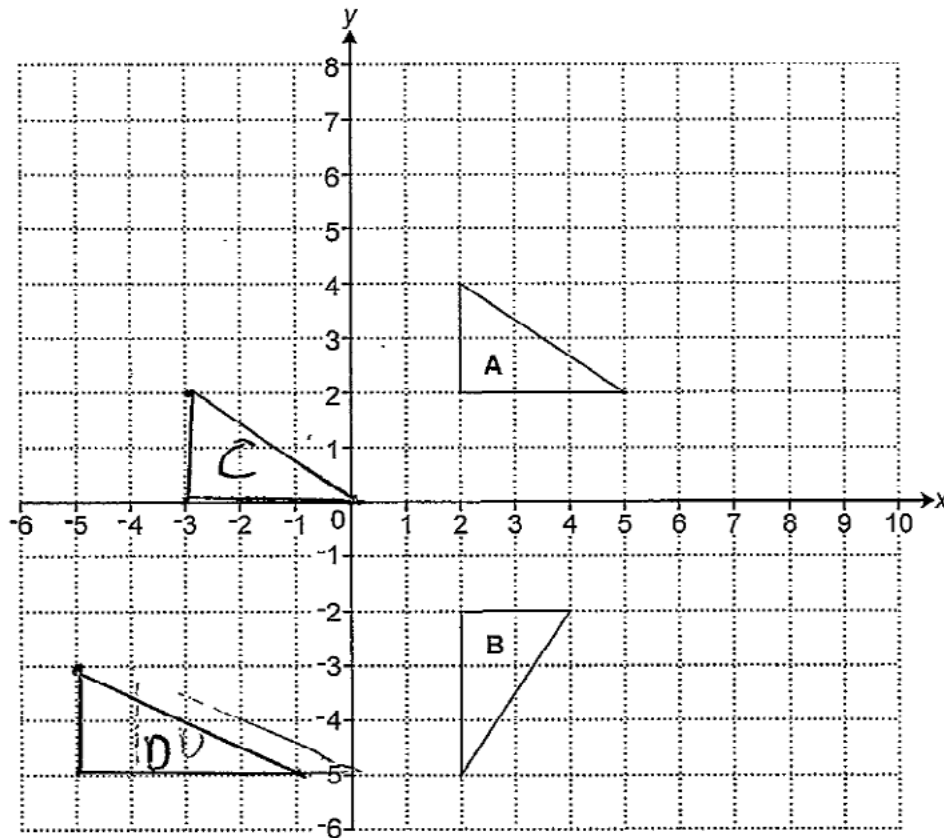
The candidate has correctly placed both 6 and 12, either of which would have scored the first mark. The other figures are incorrect and no further marks are earned.

Question 11 (a)

11 Triangles **A** and **B** are drawn on the coordinate grid.

Exemplar 1

2 marks



(a) Describe fully the **single** transformation that maps triangle **A** onto triangle **B**.

he has rotated it 90° clockwise.

[3]

Examiner commentary

This exemplar shows a correct but incomplete answer. The candidate scored 1 mark for identifying the transformation was a rotation and 1 mark for identifying the rotation was 90° clockwise.

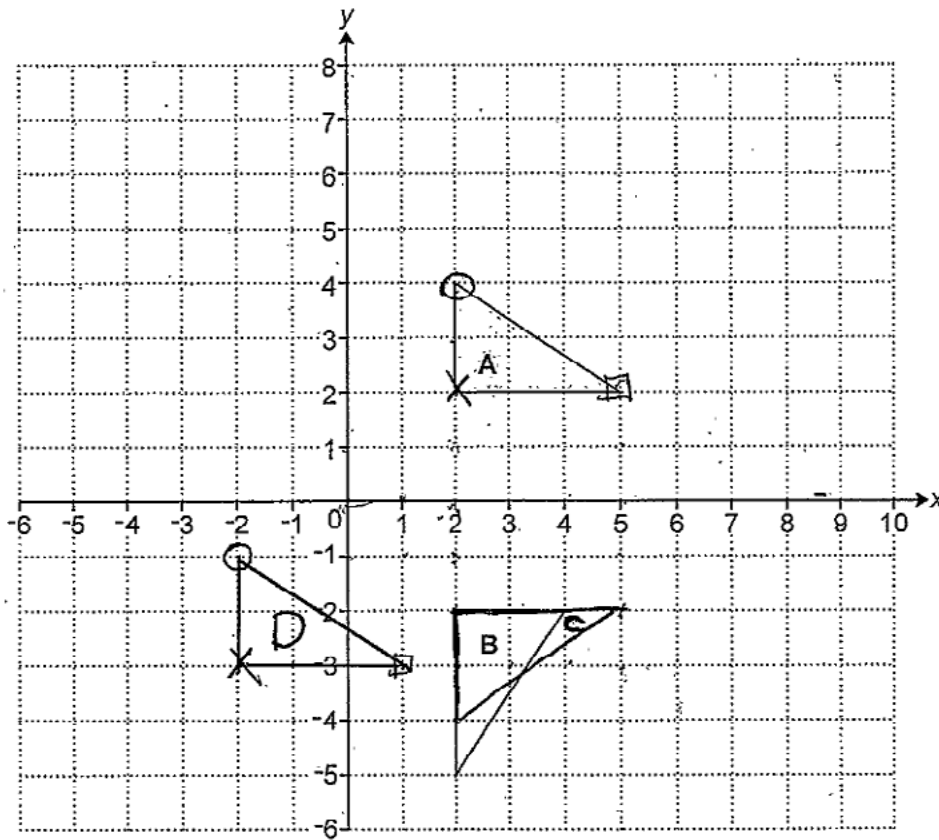
To score the final mark the candidate needed to give the centre of rotation (0, 0).

Question 11 (b)(i)

11 Triangles **A** and **B** are drawn on the coordinate grid.

Exemplar 1

1 mark



(b) (i) On the grid, reflect triangle **A** in the line $x = 0$.

Label the image **C**.

[2]

Examiner commentary

The candidate has reflected the triangle in $y = 0$ rather than $x = 0$ and is awarded 1 mark.

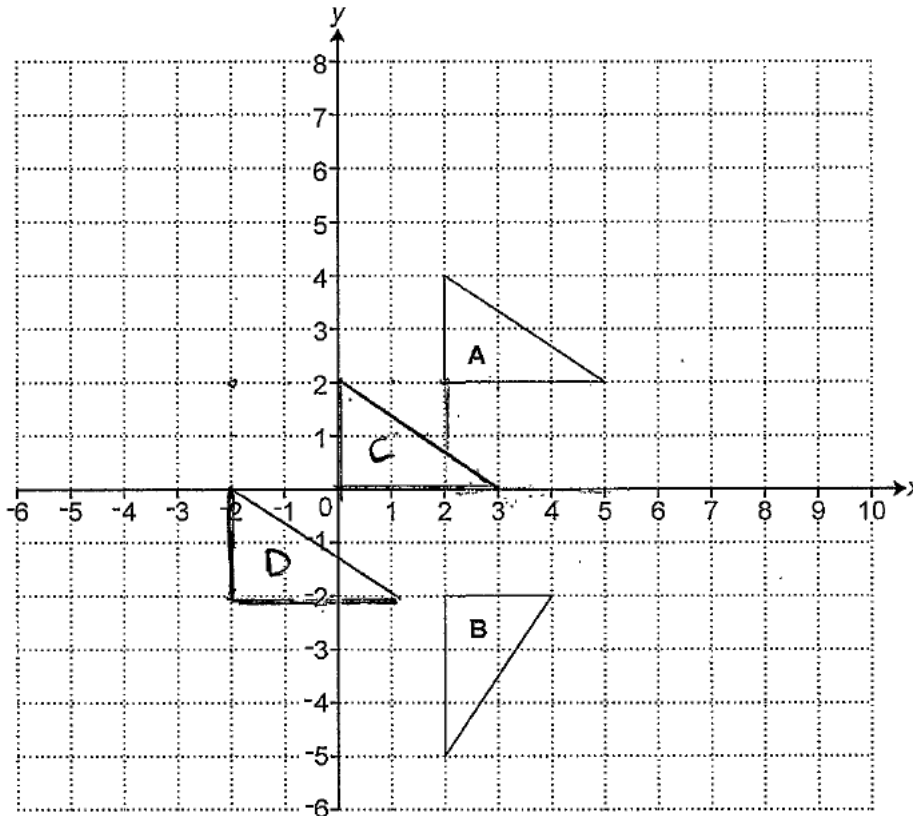
Confusing the equations of the axes was a common error.

Question 11 (b)(ii)

11 Triangles **A** and **B** are drawn on the coordinate grid.

Exemplar 1

1 mark



(b) (ii) On the grid, translate triangle **A** by vector $\begin{pmatrix} -5 \\ -4 \end{pmatrix}$.

Label the image **D**.

[2]

Examiner commentary

This scored 1 mark as triangle **A** had been correctly translated in one direction. The candidate had clearly labelled their diagrams to indicate which was **C** and which was **D**.

Question 12

- 12 Jack and Alex take rubbish to be recycled.
 Jack takes 520 kilograms, 87% of which can be recycled.
 Alex takes 750 kilograms, 61% of which can be recycled.

Calculate who takes the greatest amount of rubbish that can be recycled and by how much.

..... by kg [3]

Exemplar 1

3 marks

$$0.87 \times 520 = 452.4$$

$$0.61 \times 750 = 457.5$$

$$457.5 - 452.4 = 5.1$$

..... Alex by 5.1 kg [3]

Examiner commentary

This answer is clearly set out showing the calculation and correct answers.

Exemplar 2

1 mark

Handwritten work for Exemplar 2:

Jack: $520 \div 10 = 52$, $52 = 10\%$, $52 \times 8 = 416$.

$$\begin{array}{r} 52 \\ + 416 \\ \hline 468 \end{array}$$

Alex: $750 \div 10 = 75$, $75 \times 6 = 450$.

$$\begin{array}{r} 450 \\ + 47.5 \\ \hline 497.5 \end{array}$$

Final result: Jack = 466.44, Alex = 457.5. Difference = 8.94.
 Jack = $468 - 1.56 = 466.44$
 Alex = $497.5 - 8.94 = 488.56$

..... Jack by 8.94 kg [3]

Examiner commentary

A large number of candidates continue to use non-calculator methods for calculating percentages on a calculator paper. This means more calculations and often, as in this exemplar, leads to conceptual or arithmetic errors. This candidate scored 1 mark for 457.5.

Foundation candidates should be encouraged to use their calculators for calculations on paper 1 and on paper 3.

Question 13

13 Calculate the area of a circle with radius 14 cm.

..... cm² [2]

Exemplar 1

1 mark

$$\begin{array}{l}
 \text{Area} = \pi r^2 \\
 C = \pi d
 \end{array}
 \quad
 \begin{array}{l}
 3.14 \times 14^2 \\
 14 \times 14 = 196
 \end{array}
 \quad
 \begin{array}{l}
 3.14 \times 196 = \\
 \underline{615.44}
 \end{array}
 \quad
 \text{..... cm}^2 \text{ [2]}$$

Examiner commentary

A significant number of candidates used a value of 3.14 for pi, as shown here, which gained the method mark but not the accuracy mark.

Candidates need to be familiar with the information on the front cover of the exam paper. They are told to use the pi button or 3.142. As this is a calculator paper, candidates should be encouraged to use a calculator with a pi button.

Question 15(a)

15 Anna and Paddy take part in the same fun run.

Anna completed the fun run in 2 hours.
Her average speed was 6 kilometres per hour.
Paddy completed the fun run in 90 minutes.

(a) Work out Paddy's average speed in kilometres per hour.

(a) km/h [4]

Exemplar 1

2 marks



$$6 \times 2 = 12 \text{ km}$$

~~90~~

$$\frac{12}{90} = 0.13$$

(a)13..... km/h [4]

Examiner commentary

The candidate has shown the distance as 12 km and divided by 90. This scores M2.

It was quite common for candidates not to multiply their answer by 60 to find the speed in km/h. A small number of candidates multiplied by 100 rather than by 60.

Exemplar 2

1 mark

12 km total

(a) km/h [4]

Examiner commentary

Candidates should be encouraged to attempt all questions as they might be able to pick up some marks even if their working is incomplete. This candidate only showed the total distance as 12 km but still scored 1 mark.

Question 16

- 16 The volume of a piece of wood is 620 cm^3 .
Its density is 0.85 g/cm^3 .

Work out its mass.

..... g [2]

Exemplar 1

0 marks

Work out its mass.

$$V \div D = M$$

$$\begin{aligned} 620 &\div 0.85 \\ &= 729.411 \end{aligned}$$

..... 729 g [2]

Examiner commentary

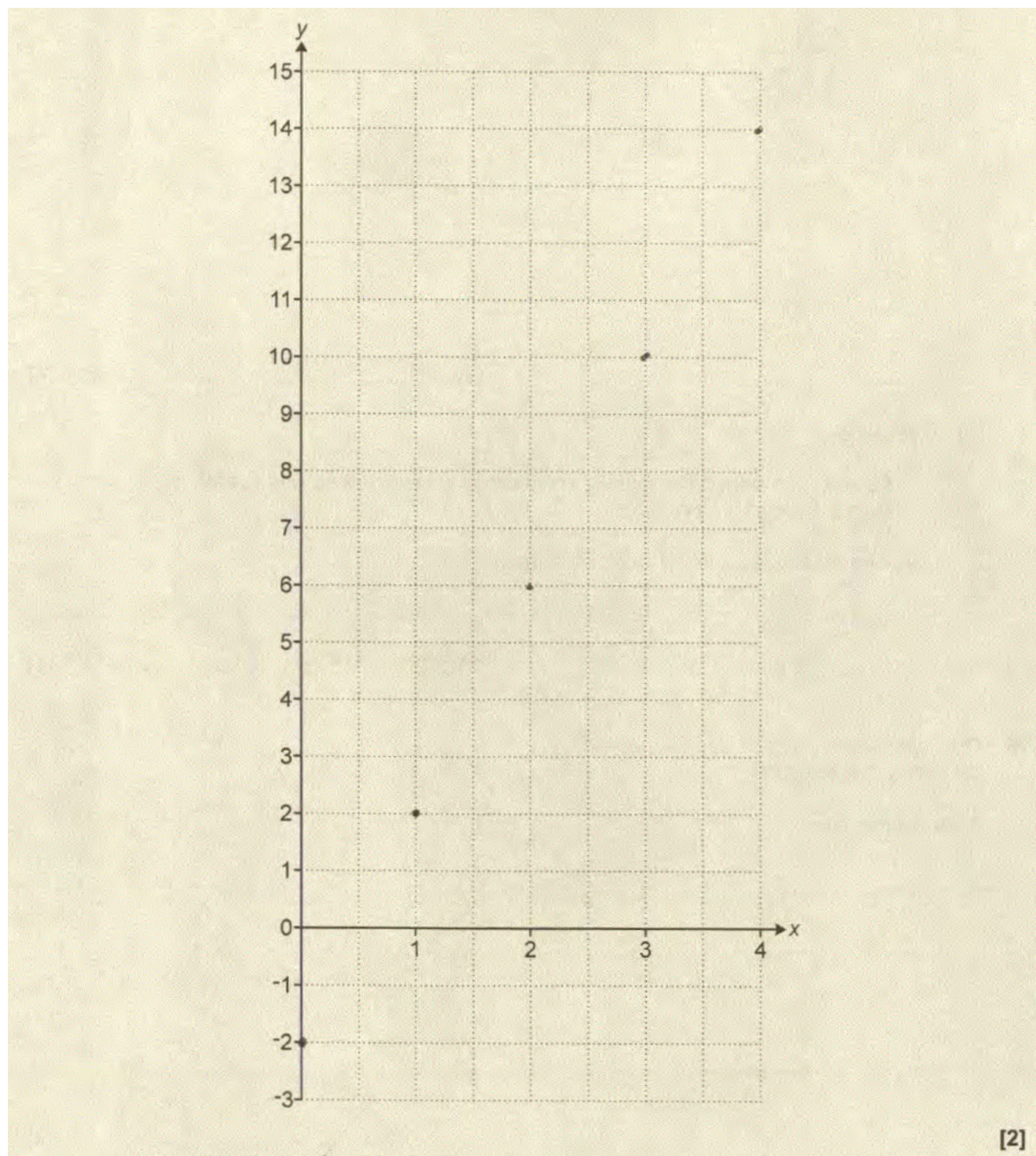
Many candidates were able to answer this question correctly. Few scored 1 mark as those who knew the correct calculation usually arrived at 527. The most common error was to divide, usually $620 \div 0.85 = 729.4$, as shown here. A small number of candidates appeared not to understand cubic **units** as they had cubed 620 and 0.85.

Question 17(b)

(b) On the grid below, draw the graph of $y = 4x - 2$ for values of x from 0 to 4.

Exemplar 1

1 mark



Examiner commentary

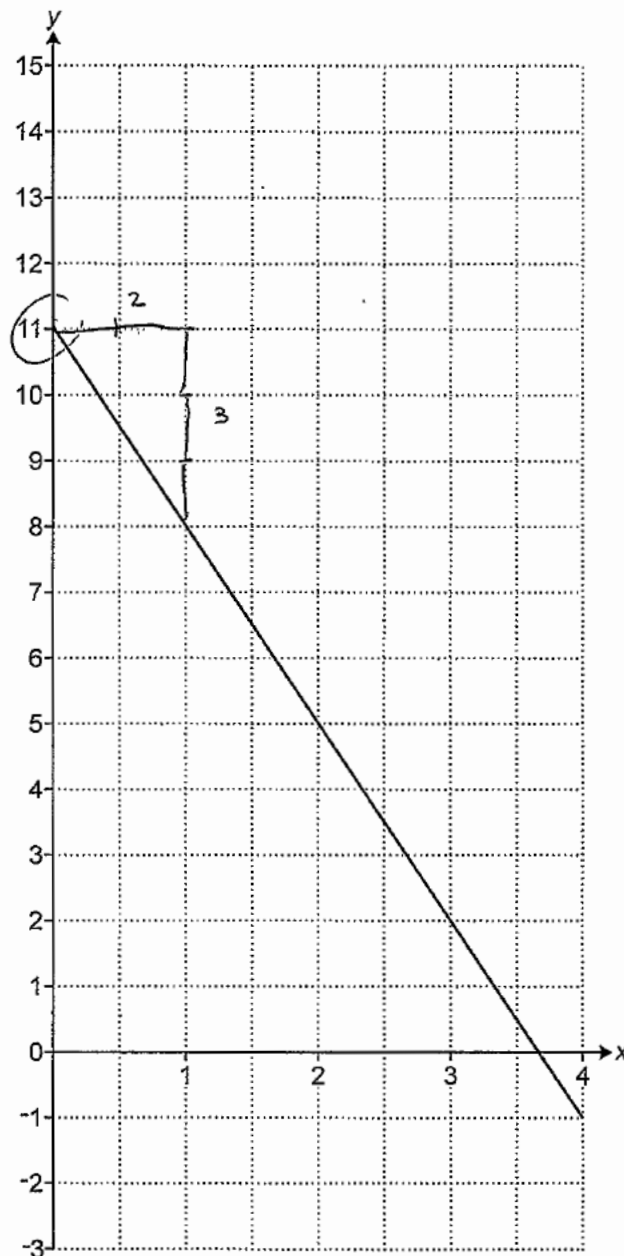
This candidate correctly plotted all the points but had not drawn the line so scored 1 out of 2 marks. This was seen on several scripts.

Question 17 (c)

(c) The diagram below shows part of another straight line.

Exemplar 1

2 marks



$$\frac{3}{2} = 1.5$$
~~$$\frac{2}{3} = 0.6$$~~

$$y = mx + c$$

Find the equation of this straight line.

$$y = mx + 11$$

$$y = 1.5x + 11$$

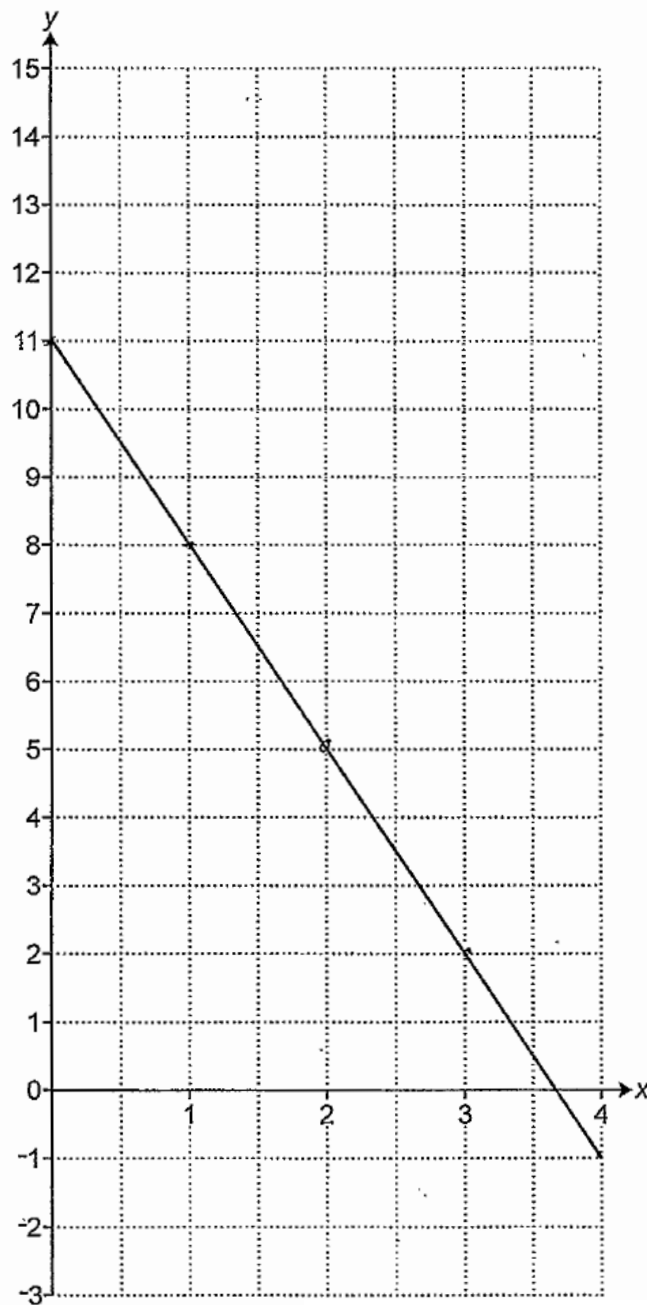
(c) $y = 1.5x + 11$ [3]

Examiner commentary

2 marks are scored for $y = mx + 11$. Many candidates did not appreciate that the scales on the x-axis and the y-axis were different, this candidate gave a horizontal distance of 2 rather than 1. Many candidates did not give a negative gradient.

Exemplar 2**1 mark**

(c) The diagram below shows part of another straight line.



Find the equation of this straight line.

(c) $-3x + 14$ [3]

Examiner commentary

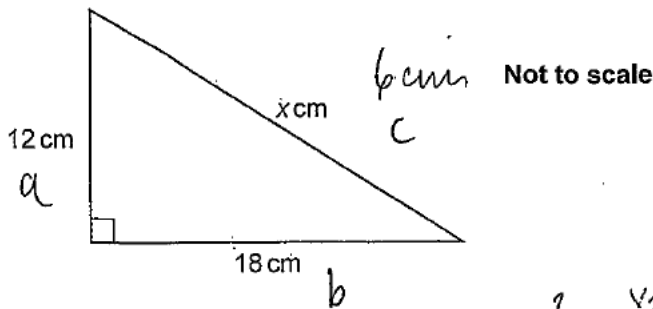
One mark is scored for the correct gradient. This is not written in the form of an equation and the intercept is also incorrect.

Question 18

18 Here is a right-angled triangle.

Exemplar 1

2 marks



Work out the value of x .

PYTHAGORAS

$$12^2 = 12 \times 12 = 144$$

$$18^2 = 18 \times 18 = 324$$

$$\hline 468$$

$$a^2 + b^2 = c^2$$

$$\sqrt{468} \quad \text{6} \overline{)13} \quad 2\frac{1}{2}$$

$$x = \dots 6 \dots \dots \dots [3]$$

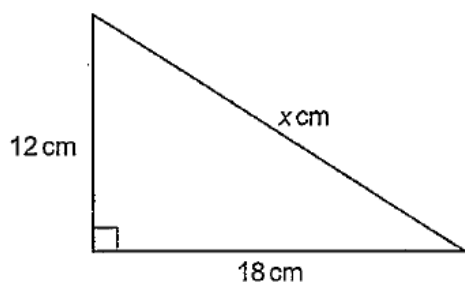
Examiner commentary

The candidate has shown a correct understanding of Pythagoras' theorem. The working is clearly shown leading to $\sqrt{468}$ for 2 marks. Their final answer is incorrect as they have not understood what was shown on their calculator display ($6\sqrt{13}$). If they had given their final answer as ($6\sqrt{13}$) they would have scored all three marks.

Candidates need to ensure they understand how to use their calculators as well as how to interpret the displayed answers.

Exemplar 2**0 marks**

18 Here is a right-angled triangle.



Not to scale

$$c = a + b$$
$$12 + 18 = 30 \text{ cm}$$

Work out the value of x .

$$x = \text{.....} \overset{30}{\text{.....}} \text{ [3]}$$

Examiner commentary

Adding or multiplying the sides was a common error, as shown in this exemplar.

Question 19 (a)

19 (a) Anne, Barry and Colin share a prize in the ratio 3 : 4 : 5.
Colin gives $\frac{1}{3}$ of his share to a charity.

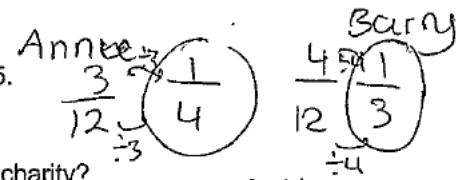
What fraction of the whole prize does Colin give to the charity?

(a) [3]

Exemplar 1

3 marks

19 (a) Anne, Barry and Colin share a prize in the ratio 3 : 4 : 5.
Colin gives $\frac{1}{3}$ of his share to a charity.



What fraction of the whole prize does Colin give to the charity?

$\frac{2}{3}$ he doesn't give away.

$3:4:5 = 12$ parts
 $\frac{1}{3} \div 5 = 4$

$\frac{1}{3}$ of 12 = 4
 $\frac{1}{3} \times \frac{5}{12} = \frac{5}{36}$

(a) $\frac{5}{36}$ [3]

Examiner commentary

It was rare for candidates to score more than 1 mark on this question. However, as shown here, the few who realised that Colin's share was $\frac{5}{12}$ and then multiplied this by $\frac{1}{3}$ were able to score all 3 marks.

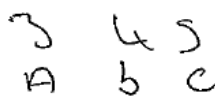
Exemplar 2

0 marks

19 (a) Anne, Barry and Colin share a prize in the ratio 3 : 4 : 5.
Colin gives $\frac{1}{3}$ of his share to a charity.

What fraction of the whole prize does Colin give to the charity?

$3 + 4 + 5 = 12$
 $\frac{1}{3}$ of 12 = 4



(a) $\frac{4}{12}$ [3]

Examiner commentary

Many candidates incorrectly calculated $\frac{1}{3}$ of 12.

Question 19 (b)

(b) Delia, Edwin and Freya share some money in the ratio 5 : 7 : 8.
Freya's share is £1600.

How much money did they share?

Exemplar 1

1 mark

How much money did they share?

D $\begin{array}{|c|c|c|c|} \hline 200 & 200 & 200 & 200 \\ \hline \end{array}$
 E $\begin{array}{|c|c|c|c|c|c|c|c|} \hline 200 & 200 & 200 & 200 & 200 & 200 & 200 & 200 \\ \hline \end{array}$
 F $\begin{array}{|c|c|c|c|c|c|c|c|c|c|} \hline 200 & 200 & 200 & 200 & 200 & 200 & 200 & 200 & 200 & 200 \\ \hline \end{array}$ 1600

$$1600 \div 8 = 200$$

(b) £ £200 [2]

Examiner commentary

This question was generally well answered with many candidates scoring both marks.

This candidate divided 1600 by 8 to work out 1 part which scored 1 mark. They did not then multiply by 20 to find the total amount of money.

Question 20 (a)

20 Luke is an office receptionist.
Each day, for 60 days, he records the number of people visiting the office.

Exemplar 1

4 marks

Number of people, (n)	Frequency	mid	Total.
$0 \leq n \leq 5$	20	x 2.5	50
$5 < n \leq 10$	14	x 7.5	105
$10 < n \leq 20$	11	x 15	165
$20 < n \leq 40$	15	x 30	450

(a) Calculate an estimate of the mean number of people visiting the office.

$$20 + 14 + 11 + 15 = 60$$

$$50 + 105 + 165 + 450 = 770$$

$$770 \div 60 = 12.8$$

(a) 13 [4]

Examiner commentary

The candidate has shown clear working with the correct answer. The candidate has (correctly) added the frequency column; had their total been incorrect they would not have scored full marks. This is another example of not reading the stem of the question carefully as the total 60 is given.

Exemplar 2

2 marks

- 20 Luke is an office receptionist.
Each day, for 60 days, he records the number of people visiting the office.

Number of people, (n)	Frequency	MP	freq \times MP
$0 \leq n \leq 5$	20	2.5	50
$5 < n \leq 10$	14	7.5	105
$10 < n \leq 20$	11	15	165
$20 < n \leq 40$	15	30	450
			770

- (a) Calculate an estimate of the mean number of people visiting the office.

$$770 \div 4 = 192.5$$

(a) 192.5 [4]

Examiner commentary

The working and answer, as shown in this exemplar, were seen too often. Candidates need to understand the divisor is the frequency not the number of groups. Having obtained an answer which was greater than 40 should have been a trigger to check the working. Finding the midpoints scored 1 mark and calculating the sum of the frequencies multiplied by the midpoints scored another mark.

Question 21

21 James and Elizabeth buy some clothes.

James buys 5 shirts and 4 jumpers. He pays £163.
Elizabeth buys 3 shirts and 2 jumpers. She pays £89.

Assume that each shirt has the same cost and that each jumper has the same cost.

Work out the cost of one shirt and the cost of one jumper.
You must show your working.

Cost of one shirt £

Cost of one jumper £ [5]

Exemplar 1

5 marks

$$5s + 4j = 163$$

$$3s + 2j = 89 \quad (\times 2)$$

$$\begin{array}{r} 5s + 4j = 163 \\ 6s + 4j = 178 \\ \hline \end{array}$$

$$\begin{array}{r} 178 - 163 \\ = 15 \end{array}$$

$$s_{\text{shirt}} = 15$$

$$3(\times 15) + 2j = 89$$

$$\begin{array}{r} 45 + 2j = 89 \\ -45 \quad -45 \\ \hline \end{array}$$

$$2j = 44$$

$$\begin{array}{r} \div 2 \\ \hline j = 22 \end{array}$$

Cost of one shirt £ 15

Cost of one jumper £ 22 [5]

Examiner commentary

This is a well set out answer showing working using simultaneous equations leading to the correct answers.

Exemplar 2

5 marks

21 James and Elizabeth buy some clothes.
 James buys 5 shirts and 4 jumpers. He pays £163.
 Elizabeth buys 3 shirts and 2 jumpers. She pays £89.

Assume that each shirt has the same cost and that each jumper has the same cost.

Work out the cost of one shirt and the cost of one jumper.
 You must show your working.

~~Handwritten work in a box:~~

$15 \times 5 = 75$ $163 - 75 = 88$ $15 \times 3 = 45$
 $\frac{88}{4} = 22$ $22 \times 2 = 44$ $45 + 44 = 89$
 $16 \times 5 = 80$ $163 - 80 = 83$
 $83 \div 4 = 20.75$
 $20.75 \times 2 = 41.50$
 $16 \times 3 = 48$ $48 + 50 = 98$
 41.50

~~$5x + 4y = 163$~~

~~$3x + 2y = 89$~~

~~$24 \times 5 = 120$ $163 - 120 = 43$ $\frac{43}{4} = 10.75$~~

~~$22 \times 5 = 110$
 $163 - 110 = 53$
 $\frac{53}{4} = 13.25$
 $13.25 \times 2 = 26.5$
 $26 \times 5 = 130$
 $163 - 130 = 33$
 $33 \div 4 = 8.25$
 $8.25 \times 2 = 16.50 + 78 = 94.50$~~

~~$17 \times 5 = 85$ $163 - 85 = 78$ $\frac{78}{4} = 19.50$ $10.75 \times 2 = 21.5$
 $24 \times 3 = 72$
 $19.50 \times 2 = 39$
 $17 \times 3 = 51$
 $51 + 39 = 90$
 $19 \times 5 = 95$ $163 - 95 = 68$
 $19 \times 3 = 57$ $17 \times 2 = 34$
 $57 + 34 = 91$~~

Cost of one shirt £15.....

Cost of one jumper £22..... [5]

Examiner commentary

This candidate arrives at the correct answers by using trial and improvement. Although this is a valid method it is time consuming as can be seen from the number of trials. Candidates should be encouraged to use the most efficient method.

Exemplar 3

2 marks

$$\begin{array}{r}
 5s + 4j = 163 \\
 -4 \\
 \hline
 5s = 159 \\
 \div 5 \\
 s = 31.80
 \end{array}$$

$$\begin{array}{r}
 2j + 3s = 89 \\
 -3 \\
 \hline
 2j = 86 \\
 \div 2 \\
 j = 43
 \end{array}$$

Cost of one shirt £ 31.80

Cost of one jumper £ 43 [5]

Examiner commentary

Candidates should be encouraged to attempt all questions. This candidate realised the need to use algebra and was successful in expressing the information in the question in the form of two equations. Although they were not able to solve the equations they scored 2 marks.

Question 22

22 Claudia invests £25 000 at a rate of 2% per year compound interest.

Calculate the total amount of **interest** she will have earned after 5 years.
Give your answer correct to the nearest penny.

£ [4]

Exemplar 1

3 marks

$$25,000 \times 1.02^5 = \underline{27602.02p}$$

£ 27602.02p [4]

Examiner commentary

The candidate has shown the correct working. However, they have given the answer as the total amount in the account at the end of the 5 years, rather than the interest earned. Three marks are earned.

The word interest was emboldened; it may help candidates if they underline or circle key words in the question.

Exemplar 2

0 marks

$$£ 250 = 1\%$$

$$£ 500 = 2\%$$

$$500 \times 5 = £ 2500$$

£ 2500 [4]

Examiner commentary

Understanding the difference between compound and simple interest will help candidates to improve on interest questions. This candidate calculated the interest earned at a rate of 2% per year simple interest so scored no marks.

Candidates should be encouraged to learn the formula for compound interest in order to answer these questions with one calculation.

This is another example of a percentage question where some candidates did not use their calculator.

Question 23(a)

23 A bus timetable shows the following information.

- A bus following route T leaves for the train station every 20 minutes.
- A bus following route A leaves for the airport every 18 minutes.
- A bus following route T and a bus following route A both leave at 8.37 am.

(a) When is the next time one of each bus is timetabled to leave at the same time?

(a) [4]

Exemplar 1

2 marks

A 8:37 am $+18$ 8:55 $+18$ 9:13 9:31 9:49 10:08
 T 8:37 am 8:57 $+20$ 9:17 9:37 9:57 10:17
 8:37 T 10:17 $+20$ 10:37 10:57
 $+18$ A 10:08 $+18$ 10:26
 $+20$ 10:37 10:57
 (a) [4]

Examiner commentary

Very few candidates used LCM to answer this question, preferring to list times was the most common approach. This candidate scored 2 marks for correctly listing the next 3 correct times of both buses but did not continue far enough to arrive at the answer.

Exemplar 2

1 mark

route T = 20 mins
 route = 18 mins
 route T 8:37 8:57 9:17 9:37 9:57
 route A 8:37 8:55 9:13 9:31 9:49
 route T 13 33
 route A

(a) [4]

Examiner commentary

The candidate uses the listing approach and is successful in adding 20 minutes three times for route T which scores 1 mark. After adding 18 minutes twice for route A, they then add 20 minutes for the final time. Candidates should be encouraged to check their working.

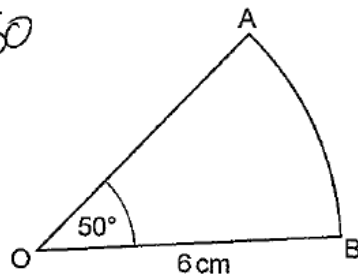
Question 24

Exemplar 1

2 marks

24 AOB is a sector of a circle, centre O.

$$\frac{360^\circ}{50^\circ} = 7.2$$



Not to scale

$$C = \pi D$$

$$3.142 \times 12 = 37.704$$

Show that the length of arc AB is 5.24 cm, correct to 3 significant figures.

[3]

$$\frac{37.704}{7.2} = 5.24$$

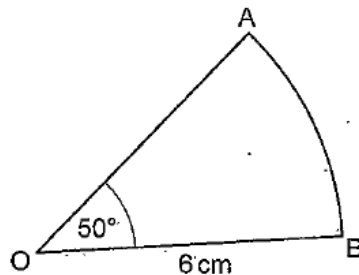
Examiner commentary

This is a good attempt at this question which scored 2 of the 3 marks for the correct method. It is a show that question, so in order to score the final mark an answer of more than 3 significant figures needed to be seen before rounding to 5.24.

Exemplar 2

1 mark

24 AOB is a sector of a circle, centre O.



Not to scale

Show that the length of arc AB is 5.24 cm, correct to 3 significant figures.

[3]

$$\text{Circumference} = 2\pi r = 12\pi$$

Examiner commentary

This candidate has realised the need to calculate the circumference of the circle but is unable to make further progress. One mark is scored.

Question 25

- 25 Bennie is 7 years older than Ayesha.
 Chloe is twice as old as Bennie.
 The sum of their three ages is 57.

Work out the ages of Ayesha, Bennie and Chloe.

Ayesha's age is

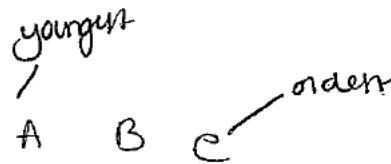
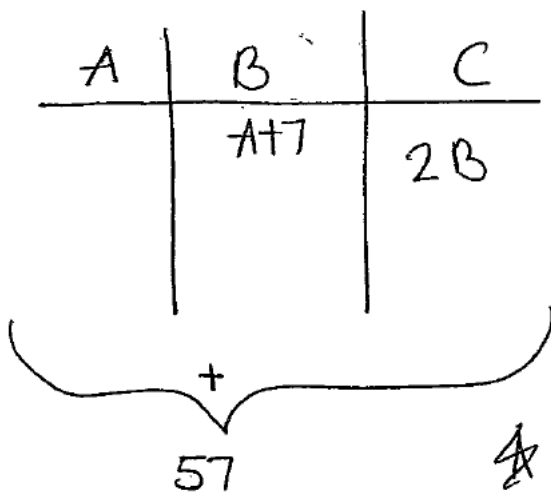
Bennie's age is

Chloe's age is [6]

Exemplar 1

6 marks

Work out the ages of Ayesha, Bennie and Chloe.



$$C = 2(A+7)$$

~~$$2A + 14$$~~

Ayesha's age is: 9

Bennie's age is: 16

Chloe's age is: 32 [6]

$$2(A+7) + (A+7) + A = 57$$

$$2A + 14 + A + 7 + A = 57$$

$$4A + 21 = 57$$

$$57 - 21 = 36 \div 4 = 9$$

$$A = 9$$

$$B = 7 + 9 = 16$$

$$C = 32$$

Examiner commentary

This question was designed as an algebra question and many candidates used algebra successfully in order to solve the problem. This candidate scored full marks.

Exemplar 2**6 marks**

$$A + B + C = 57$$

+7 x2

$$22 + 29 + 31 = 82 \times \text{too high}$$

$$17 + 24 + 48 \times$$

$$10 + 17 + 34 = 61$$

$$8 + 15 + 30 = 53 \text{ too low}$$

$$9 + 16 + 32 = 57$$

Ayesha's age is9.....

Bennie's age is16.....

Chloe's age is32..... [6]

Examiner commentary

Although this was designed as an algebra question some candidates chose to use trial and improvement to arrive at the correct answers, as shown here. This candidate scored full marks.

Exemplar 3**2 marks**

$$B = A + 7$$

$$C = B \times 2$$

Ayesha's age is

Bennie's age is

Chloe's age is [6]

Examiner commentary

The candidate realised the need to use algebra and had written two correct equations. Two marks were scored.

Candidates should be encouraged to attempt all questions as part marks can be earned even if they are unable to reach a final answer.

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