Cambridge Assessment International Education

Example Responses – Paper 4

Cambridge IGCSE™ / IGCSE (9–1) Mathematics 0580 / 0980

For examination from 2025

Cambridge Pathway

Contents

Introduction

The main aim of this booklet is to exemplify standards for those teaching Cambridge IGCSE / IGCSE (9-1) Mathematics 0580 / 0980.

This booklet contains responses to all questions from June 2025 Paper 41, which have been written by a Cambridge examiner. Responses are accompanied by a brief commentary highlighting common errors and misconceptions where they are relevant.

The question papers and mark schemes are available to download from the School Support Hub

0580 June 2025 Question Paper 41

0580 June 2025 Mark Scheme 41

Past exam resources and other teaching and learning resources are available from the School Support Hub

Question 1-2

1 Solve.

$4c - 9 = 13$

$4c - 9 = 13$

$4c = 22$

$c = 5.5$

$c =$ ..... 5.5 ..... [2]

Examiner comment

A less common method used the first step $c - \frac{9}{4} = \frac{13}{4}$.

2 Work out.

$$\frac{16.71 + 46.13}{\sqrt{8.6^2 - 3.5^2}}$$

Give your answer correct to 2 significant figures.

7.99...

= 8.0

..... 8.0 ..... [2]

Examiner comment

Candidates should have worked out the calculation in one go, or stored any intermediate values in their calculators, to avoid losing accuracy by using rounded figures within the calculation.

Question 3

3 In the USA, one gallon of fuel costs \$4.83 .
In the UK, one litre of fuel costs £1.62 .

The exchange rate is £1 = \$1.215 .
1 gallon = 3.785 litres

In which country does 1 litre of fuel cost more and by how much?
Give your answer in dollars.

cost in \$ of one litre in the USA is $\frac{4.83}{3.785} = \$1.276$

cost in \$ of one litre in the UK is $1.62 \times 1.215 = \$1.968$

$1.968 - 1.276 = 0.692$

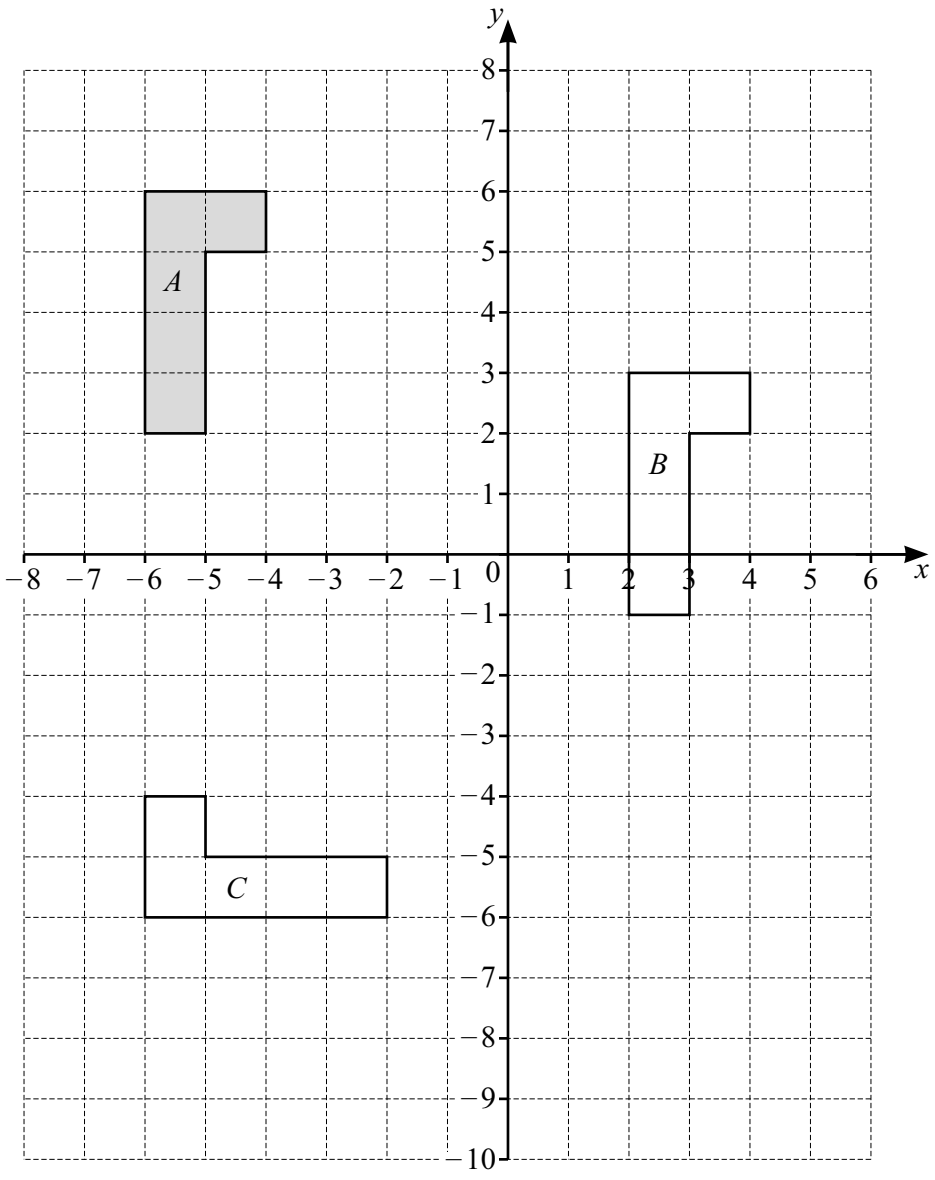
.....UK..... by \$ .....0.69..... [3]

Examiner comment

Candidates who wrote down a few words to go with each calculation were often clearer about what was represented by the numbers they had calculated.

Question 4

4



so

(a) Describe fully the **single** transformation that maps

(i) shape A onto shape B

translation $\begin{pmatrix} 8 \\ -3 \end{pmatrix}$

[2]

Examiner comment

Although 'translate 8 right and 3 down' was a correct description, writing the answer using mathematical vector notation was preferred.

(ii) shape A onto shape C.

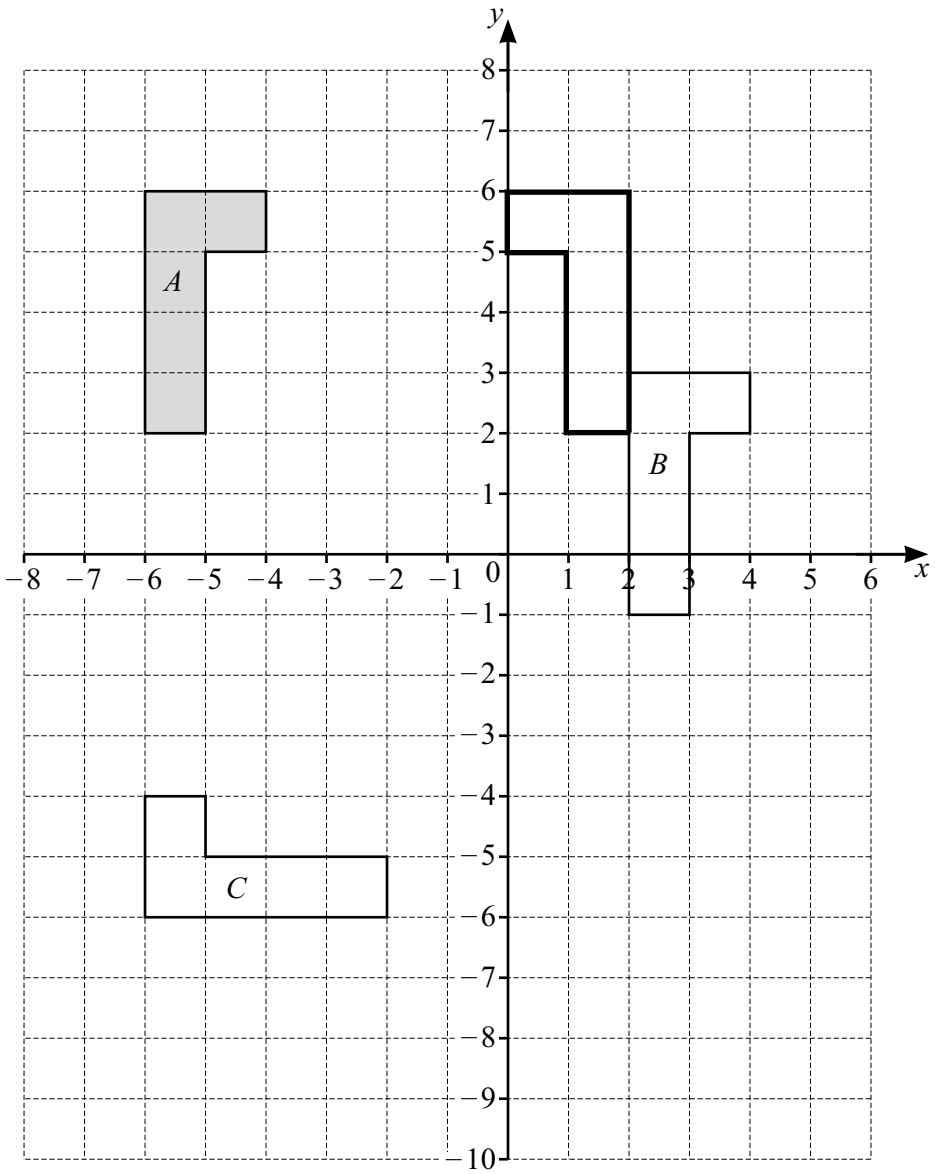
rotation, centre (0,0) 90 anticlockwise

..... [3]

Examiner comment

- Candidates needed to include all three parts for a complete description.
- Responses describing more than one transformation were not awarded any marks because the question asked for the description of a **single** transformation.

(b) On the grid, draw the image of shape A after a reflection in the line $x = -2$. [2]



Question 5

5 **(a)** These are the first 5 terms of a sequence.

1 8 27 64 125

Find the 10th term of this sequence.

.....1000..... [1]

Examiner comment

Candidates should be able to recognise the cube numbers without any calculations required.

(b) These are the first 5 terms of a different sequence.

5 8 13 20 29

Find the nth term of this sequence.

5 8 13 20 29

3 5 7 9

2 2 2

	5	8	13	20	29
$-n^2$	-1	-4	-9	-16	-25
	4	4	4	4	4

.....$n^2 + 4$..... [2]

Examiner comment

Alternative methods included solving a pair of simultaneous equations for the nth term $n^2 + an + b$. For example, $n = 1$: $1 + a + b = 5$ and $n = 2$: $4 + 2a + b = 8$ gives $a = 0$ and $b = 4$

(c) The **sum of the first *n* terms** of another sequence is $\frac{n}{2}(5n-1)$.

(i) Use $n = 2$ to find the sum of the first two terms in this sequence.

$\frac{2}{2} \times (5 \times 2 - 1) = 9$

9
..... [1]

(ii) Find the 3rd term of this sequence.

$n = 3$: $\frac{3}{2} \times (5 \times 3 - 1) = 21$

$21 - 9 = 12$

..... 12 ..... [2]

Examiner comment

Candidates needed to realise that 21 was the **sum of the first three terms** and not the value of the third term.

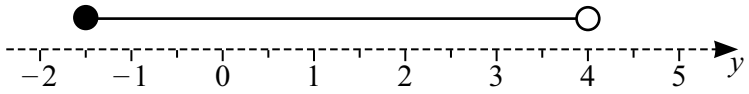
Question 6-7

6 Expand.

$5x^2(3x-2)$

.....$15x^3 - 10^2$..... [2]

7



Write down the inequality in y shown by the number line.

.....$-1.5 \leqslant y < 4$..... [2]

Question 8-9

8 Hadi buys a dishwasher.
He can either pay a single payment of $980 or he can pay using a monthly plan.
The monthly plan is 20% of $980 **plus** 12 payments of $75.25 .

(a) Hadi uses the monthly plan.

Calculate the total amount Hadi pays.

$\frac{20}{100} \times 980 + 12 \times 75.25$

$ ..... 1099 ..... [2]

(b) Find the percentage increase in the cost using the monthly plan compared to a single payment.

$\frac{1099 - 980}{980} \times 100$

..... 12.1 ..... % [2]

9 In a sale, the original price of a sewing machine is reduced by $38.
This is an 8% reduction in the original price.

Work out the original price of the sewing machine.

$x \times \frac{8}{100} = 38$

$x = \frac{38 \times 100}{8}$

$ ..... 475 ..... [2]

Question 10

10 **(a)** Write down **all** the factors of 18.

1, 2, 3, 6, 9, 18 [2]

(b) Factorise.

$3y - xy + 15 - 5x$

$y(3 - x) + 5(3 - x)$

$= (y + 5)(3 - x)$

$(y + 5)(3 - x)$ [2]

Examiner comment

An example of an alternative correct final answer was – $(x - 3)(5 + y)$. However, this was not as neat as the negative sign can be removed by multiplying the contents of the first bracket.

(c) $3y - xy + 15 - 5x = 18$

where x and y are positive integers.

Using your answers to **part (a)** and **part (b)**, find one possible value of x and the corresponding value of y.

$(y + 5)(3 - x) = 18$

since $y > 0$ and $18 > 0$ then $3 - x > 0$, and hence $x < 3$.

as x is a positive integer $x = 1$ or $x = 2$

when $x = 1$, $(y + 5)(3 - 1) = 18$

$y = 4$

$x =$ 1 , $y =$ 4 [2]

Examiner comment

- The only other alternative solution came from $x = 2$.
  $(y + 5)(3 - 2) = 18$
  $y = 13$
- The solution set out in the example response was obtained logically. It was possible to find either or both of these correct pairs of solutions by trials. The logical method proved there were only two possible solutions.

Question 11-12

11 A warehouse has a floor area of 800 m^2.
The plan of the warehouse is drawn to a scale of 1 : 50.

Calculate the floor area on the plan.
Give your answer in square centimetres.

$800\ m^2 = 800 \times 100^2\ cm^2$

$= 8000\ 000\ cm^2$

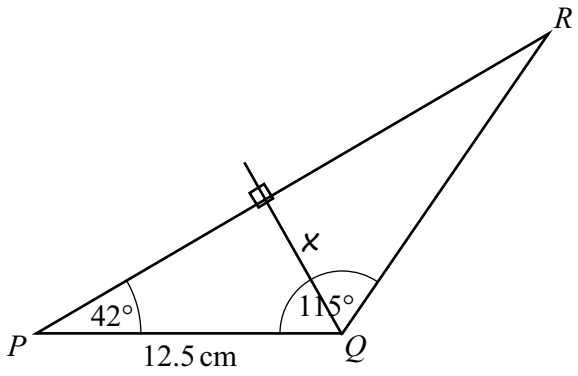
$\frac{8000000}{50^2} = 3200\ cm^2$

..... 3200 ..... cm^2 [3]

Examiner comment

This example response was completed in stages. It could have been answered with one calculation or with the calculations completed in the reverse order.

12



NOT TO SCALE

The diagram shows triangle PQR.

Calculate the shortest distance from Q to PR.

$\sin 42 = \frac{x}{12.5}$

$x = \sin 42 \times 12.5$

$x = 8.36$

..... 8.36 ..... cm [3]

Examiner comment

Although there was no requirement to write on the diagram, showing the right-angled triangle and marking x was helpful for many candidates in forming the correct trigonometrical equation.

Question 13-14

13 Make x the subject of this formula.

$$A = w^2 + 5x^2$$

$$A - w^2 = 5x^2$$

$$\frac{A - w^2}{5} = x^2$$

$x = \sqrt{\frac{A - w^2}{5}}$ [3]

Examiner comment

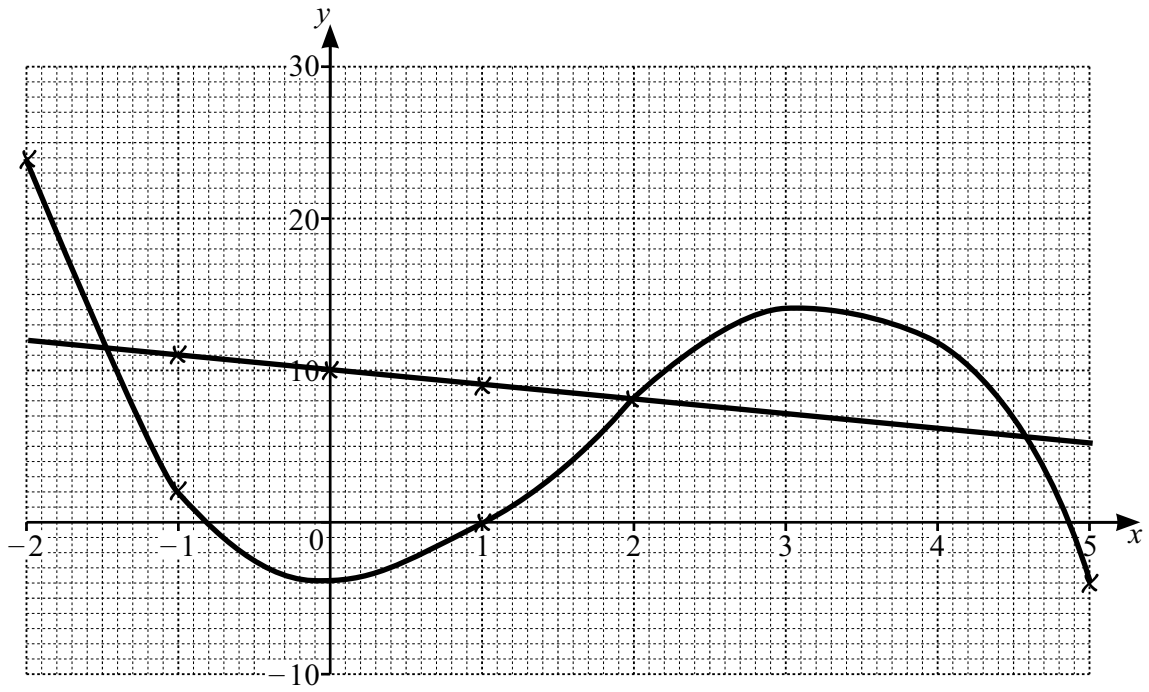
- Both $x = \sqrt{\frac{A - w^2}{5}}$ and $x = \pm\sqrt{\frac{A - w^2}{5}}$ were accepted for full marks.
- The square root sign must be large enough to cover the whole of the fraction.
- The fraction line must be clearly under both the A and the $-w^2$.

14 The table shows some values for $y = 5x^2 - x^3 - 4$.

x	-2	-1	0	1	2	3	4	5
y	24	2	-4	0	8	14	12	-4

(a) Complete the table. [3]

(b) On the grid, draw the graph of $y = 5x^2 - x^3 - 4$ for $-2 \leqslant x \leqslant 5$.



[4]

Examiner comment

Graphs needed to be smooth with a clear single curve, with the correct curvature.

(c) By drawing a suitable straight line on the grid, solve the equation $x^3 - 5x^2 - x + 14 = 0$.

$x^3 - 5x^2 - x + 14 = 0$

$-x + 10 = 5x^2 - x^3 - 4$

$y = -x + 10$

$x =$ ...-1.5... or $x =$ ...2... or $x =$ ...4.5... [4]

Examiner comment

- To be awarded full marks on this question, the line $y = -x + 10$ needed to be drawn accurately on the grid.
- Candidates who found the correct roots by either drawing $y = x^3 - 5x^2 - x + 14$ or solving $x^3 - 5x^2 - x + 14 = 0$, using trial and error or their calculator, were awarded a maximum of 1 mark.

Question 15

15 The height of each of 140 basketball players is recorded.
The table shows the results.

Height (h cm)	$160 < h \leqslant 180$	$180 < h \leqslant 185$	$185 < h \leqslant 190$	$190 < h \leqslant 200$	$200 < h \leqslant 210$
Frequency	7	12	31	70	20

(a) Calculate an estimate of the mean height.

$$\frac{170 \times 7 + 182.5 \times 12 + 187.5 \times 31 + 195 \times 70 + 205 \times 20}{140}$$

$= 192$

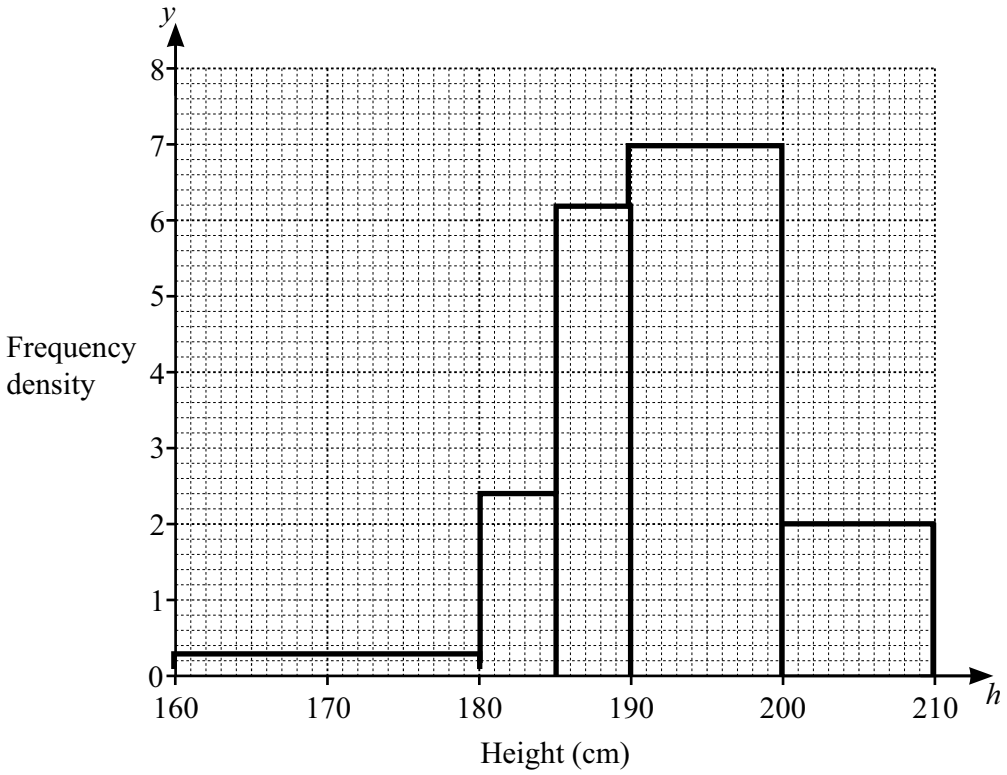
192 cm [4]

(b) Two of the players are chosen at random.

Find the probability that both players have a height greater than 190 cm and no more than 200 cm.

$\frac{70}{140} \times \frac{69}{139} = \frac{69}{278}$ [2]

(c) Complete the histogram to show the information in the frequency table.



[3]

$\frac{7}{180-160}$ $\frac{12}{185-180}$ $\frac{31}{190-185}$ $\frac{70}{200-190}$

$= 0.35$ $= 2.4$ $= 6.2$ $= 7$

Question 16-17

16 Mateo invests \$1250 at a rate of r% per year compound interest.
At the end of 6 years the total value of his investment is \$1484.

Calculate the value of r.

$$1250 \times \left(1 + \frac{r}{100}\right)^6 = 1484$$

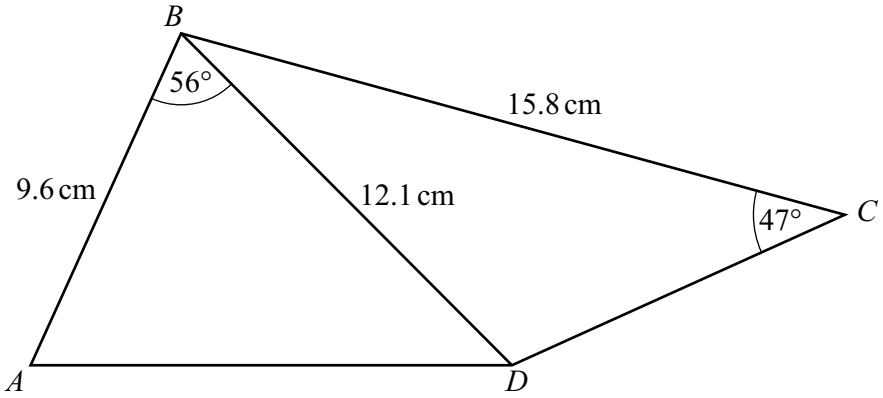
$$\left(1 + \frac{r}{100}\right)^6 = \frac{1484}{1250}$$

$$1 + \frac{r}{100} = \sqrt[6]{\frac{1484}{1250}} = 1.0290...$$

$$\frac{r}{100} = 0.0290...$$

$r =$ 2.90 [3]

17



NOT TO SCALE

The diagram shows a quadrilateral $ABCD$.

(a) Calculate AD.

$AD^2 = 9.6^2 + 12.1^2 - 2 \times 9.6 \times 12.1 \times \cos 56 = 108.658...$

$AD =$ $\sqrt{108.658...} = 10.4$ cm [3]

Examiner comment

Many candidates incorrectly calculated all of the terms multiplied by cos56, i.e. $(9.6^2+12.1^2-2\times9.6\times12.1)\times\cos 56$.

(b) Calculate the obtuse angle BDC.

$$\frac{\sin BDC}{15.8} = \frac{\sin 47}{12.1}$$

$$\sin BDC = \frac{\sin 47}{12.1} \times 15.8 = 0.95499...$$

acute angle BDC =72.744...

obtuse angle BDC = 180-72.744= 107.3

Angle BDC = ...107.3..... [4]

Examiner comment

The requirement that angle *BDC* was obtuse was often overlooked and the acute angle given.

(c) Calculate the area of the quadrilateral.

$$\frac{1}{2} \times 9.6 \times 12.1 \times \sin 56 + \frac{1}{2} \times 15.8 \times 12.1 \times \sin(180 - 47 - 107.3)$$

.....89.6..... cm^2 [3]

Examiner comment

- Answers falling within the range 89.59 to 89.80… were accepted, which allowed for candidates using values between 107.2 and 107.3 from the previous part, or correct longer alternative methods.
- Candidates were awarded method marks if they used an incorrect angle from part **(b)**.

Question 18-19

18 $2x^2 + 12x - 2$ can be written in the form $a(x+b)^2 - c$.

Find the values of a, b and c.

$2x^2 + 12x - 2$

$= 2(x^2 + 6x - 1)$

$= 2((x + 3)^2 - 9 - 1)$

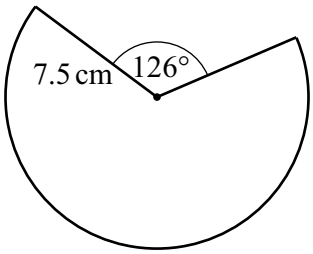
$= 2(x + 3)^2 - 20$

$a =$ .....2..... , $b =$ .....3..... , $c =$ .....20..... [3]

Examiner comment

- In the method shown, the square was completed to convert the expression to the given form.
- An alternative method expanded the brackets and gave $2x^2 + 12x - 2 = ax^2 + 2abx + ab^2 - c$. Equating coefficients gave $x = 2$, $2ab = 12$ and $ab^2 - c = -2$ and hence $b = 3$, $c = 20$.

19



NOT TO SCALE

The diagram shows a major sector of a circle with radius 7.5 cm.

Calculate the perimeter of the major sector.

$\frac{360 - 126}{360} \times 2 \times \pi \times 7.5 + 2 \times 7.5$

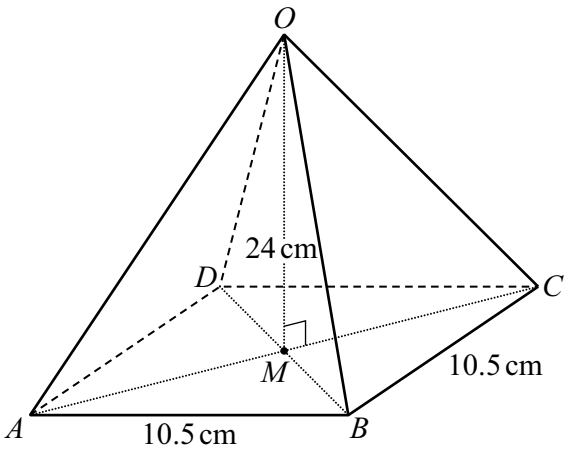
.....45.6..... cm [4]

Examiner comment

Many candidates found the area rather than the perimeter, or did not add the two radii to the length of the major arc.

Question 20

20



NOT TO SCALE

The diagram shows a pyramid $OABCD$.
The pyramid has a square base, $ABCD$, with sides 10.5 cm.
The vertex O is vertically above the centre of the base, M.
The height of the pyramid is 24 cm.

(a) Calculate the angle that OA makes with the base.

$(AC)^2 = 10.5^2 + 10.5^2$

$AC = \sqrt{220.5}$

$AM = 0.5 \times \sqrt{220.5}$

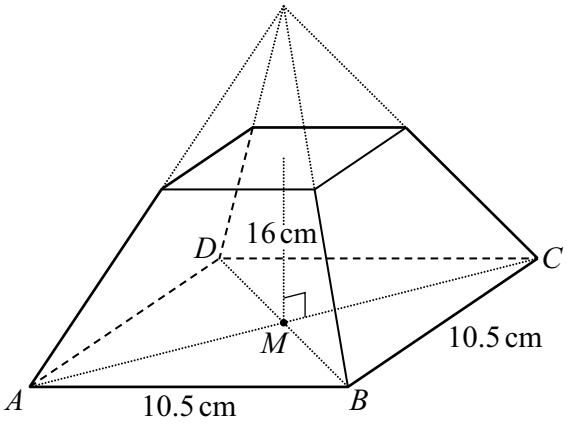
$\tan OAM = \dfrac{24}{0.5\sqrt{220.5}}$

angle OAM = 72.8 [4]

Examiner comment

- There were other methods for finding AM. These included AM = 10.5cos45.
- There were longer alternative methods for working out angle OAM and most involved either tan or sin in triangle OAM.

(b)



NOT TO SCALE

The diagram shows a frustum of the pyramid $OABCD$.
The height of the frustum is 16 cm.

Calculate the volume of the frustum.

$$\frac{10.5}{x} = \frac{24}{24-16}$$

$$x = 10.5 \times \frac{8}{24} = 3.5$$

$$\text{volume of frustrum} = \frac{1}{3} \times 10.5^2 \times 24 - \frac{1}{3} \times 3.5^2 \times 8$$

..... 849 ..... cm^3 [5]

Examiner comment

- A correct alternative method involved similar pyramids.

  Length scale factor $= \frac{24-16}{24} = \frac{1}{3}$

  Volume scale factor $= \frac{1}{27}$

  Volume of frustrum $= \left(1 - \frac{1}{27}\right) \times \frac{1}{3} \times 10.5^2 \times 24 = 849$
- A common misconception was to use the height of the frustrum, 16 cm, with 10.5 cm in the formula for the volume of a pyramid.

Question 21

21 $\dfrac{16^{5m}}{4} = 64^{2n}$

Find m in terms of n.

$\dfrac{16^{5m}}{4} = 64^{2n}$

$\dfrac{(4^2)^{5m}}{4^1} = (4^3)^{2n}$

$4^{10m-1} = 4^{6n}$

$10m - 1 = 6n$

$m = \dfrac{6n+1}{10}$ [3]

Examiner comment

- This question was challenging. Most candidates started with an incorrect step of dividing or multiplying without consideration of the powers, with either $\dfrac{16^{5m}}{4}$ or $4 \times 64^{2n} = 256^{2n}$ frequently seen.
- A similar alternative method included writing each part with a base of 2:

$\dfrac{16^{5m}}{4} = 64^{2n}$

$\dfrac{(2^4)^{5m}}{2^2} = (2^6)^{2n}$

$2^{20m-2} = 2^{12n}$

$20^m - 2 = 12^n$

$m = \dfrac{12n+2}{20}$

Question 22

22 $I = \frac{V}{R}$

V is 50, correct to the nearest 10.
R is 13, correct to the nearest integer.

Calculate the upper bound of I.

$I_{UB} = \frac{V_{UB}}{R_{LB}}$

$= \frac{50 + 5}{13 - 0.5}$

4.4 [3]

Cambridge Assessment International Education
The Triangle Building, Shaftesbury Road, Cambridge, CB2 8EA, United Kingdom
t: +44 1223 553554
e: info@cambridgeinternational.org www.cambridgeinternational.org