Please check the examination details below before entering your candidate information

Candidate surname	Other names

Centre Number | Candidate Number

Pearson Edexcel International GCSE (9-1)

Thursday 15 May 2025

Morning (Time: 2 hours)

Paper reference **4WM1H/01**

Mathematics A (Modular)

UNIT 1H
Higher Tier

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Without sufficient working, correct answers may be awarded no marks.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- **Calculators may be used.**
- You must **NOT** write anything on the formulae page.
- Anything you write on the formulae page will gain NO credit.

Information

- The total mark for this unit is 100.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Check your answers if you have time at the end.

Turn over ▶

P81639A

Y:1/1/1/1/1/1/

P 8 1 6 3 9 A 0 1 2 8

Pearson

International GCSE Mathematics

Formulae sheet – Higher Tier

Arithmetic series

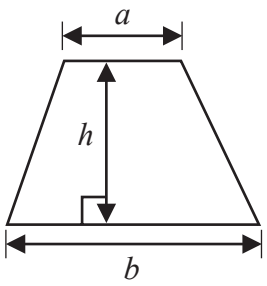
Sum to n terms, $S_n = \frac{n}{2}[2a + (n-1)d]$

The quadratic equation

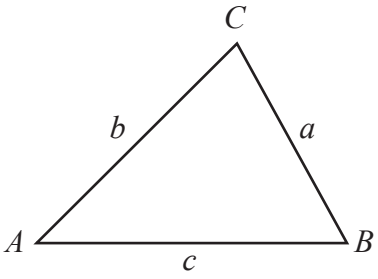
The solutions of $ax^2 + bx + c = 0$ where $a \neq 0$ are given by:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Area of trapezium $= \frac{1}{2}(a+b)h$



Trigonometry



In any triangle *ABC*

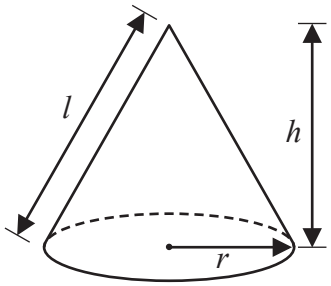
Sine Rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine Rule $a^2 = b^2 + c^2 - 2bc\cos A$

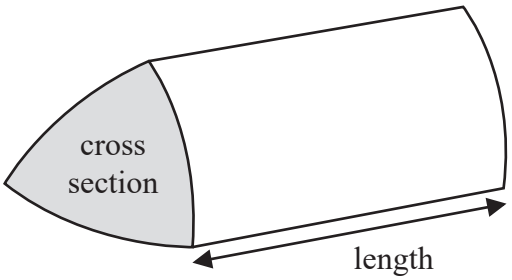
Area of triangle $= \frac{1}{2}ab\sin C$

Volume of cone $= \frac{1}{3}\pi r^2 h$

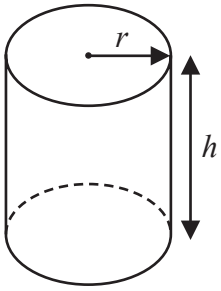
Curved surface area of cone $= \pi rl$



Volume of prism
= area of cross section × length

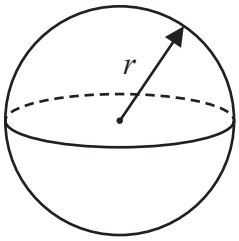


Volume of cylinder $= \pi r^2 h$
Curved surface area of cylinder $= 2\pi rh$



Volume of sphere $= \frac{4}{3}\pi r^3$

Surface area of sphere $= 4\pi r^2$



Answer ALL TWENTY FIVE questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Without using a calculator, work out

$$3\frac{2}{3} \times 2\frac{4}{7}$$

Show each stage of your working.
Give your answer as a mixed number in its simplest form.

.....

(Total for Question 1 is 3 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

2 The height of a tree is 17.8 metres correct to one decimal place.

(a) Write down the lower bound for the height of the tree.

..... metres

(1)

The weight of an apple is 145 grams correct to the nearest 5 grams.

(b) Write down the upper bound for the weight of the apple.

..... grams

(1)

$$A = \frac{4.766 \times 815}{0.399}$$

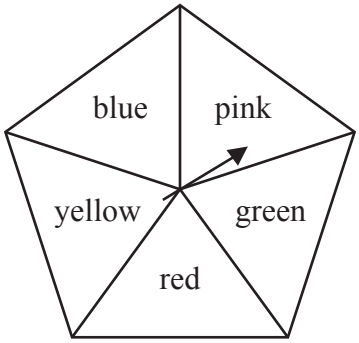
(c) By rounding each number to one significant figure, work out an estimate for the value of A
Show your working clearly.

.....

(2)

(Total for Question 2 is 4 marks)

3 Here is a biased spinner.
The spinner can land on pink or on green or on red or on yellow or on blue.



The table gives information about the probability that, when the spinner is spun, it will land on each colour.

Colour	pink	green	red	yellow	blue
Probability	0.14	0.23	$2x$	0.18	$7x$

Jim is going to spin the spinner 500 times.

Work out the expected number of times the spinner will land on blue.

.....

(Total for Question 3 is 4 marks)

4 The diagram shows triangle ABC and a semicircle.

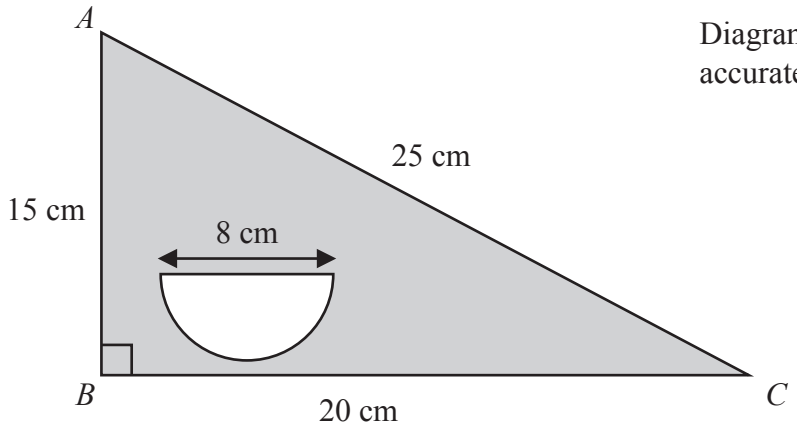


Diagram **NOT** accurately drawn

$AB = 15$ cm $BC = 20$ cm $AC = 25$ cm angle $ABC = 90°$

The diameter of the semicircle is 8 cm

Work out the area of the region shown shaded in the diagram.
Give your answer correct to 3 significant figures.

..... cm^2

(Total for Question 4 is 3 marks)

5 $x^5 \times x^7 = x^m$

(a) Find the value of m

$m =$ .....

(1)

$y^8 \div y^3 = y^n$

(b) Find the value of n

$n =$ .....

(1)

(c) Simplify fully $(5a^4r^2)^3$

.....

(2)

(Total for Question 5 is 4 marks)

6 The diagram shows a block in the shape of a cuboid.

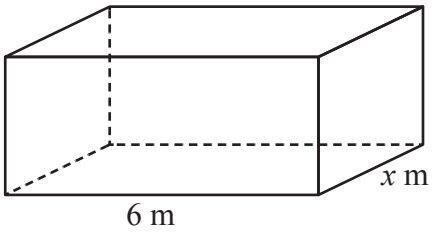


Diagram **NOT** accurately drawn

The block has a horizontal base with length 6 m and width x m

The block is placed on a table so that the whole of its horizontal base is in contact with the table.

The block exerts a force of 702 newtons on the table.
The pressure on the table due to the block is 65 newtons/m²

Work out the value of x

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

$x =$ .....

(Total for Question 6 is 3 marks)

7 (a) Solve $x - 4 = \dfrac{3 + 2x}{6}$

Show clear algebraic working.

$x =$ .....

(3)

(b) (i) Factorise $y^2 - 11y + 30$

.....

(2)

(ii) Hence solve $y^2 - 11y + 30 = 0$

.....

(1)

(Total for Question 7 is 6 marks)

8 $\mathscr{E} = \{18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30\}$

$A = \{\text{even numbers}\}$

$B = \{\text{multiples of 3}\}$

$C = \{\text{multiples of 5}\}$

(a) List the members of the set $(A \cup B)'$

.....

(2)

Sophie writes down the statement $B \cap C = \varnothing$

(b) Explain why Sophie's statement is wrong.

.....

.....

(1)

D is a set such that $A \cap D = \{18, 26\}$
The set D has exactly 5 members.

(c) List the members of one possible set D

.....

(2)

(Total for Question 8 is 5 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

9 $7^x = 1$

(a) Write down the value of x

$x =$ .....

(1)

$$\frac{8^{-4} \times 8^{11}}{8^{12}} = 8^n$$

(b) Work out the value of n

$n =$ .....

(2)

(Total for Question 9 is 3 marks)

10

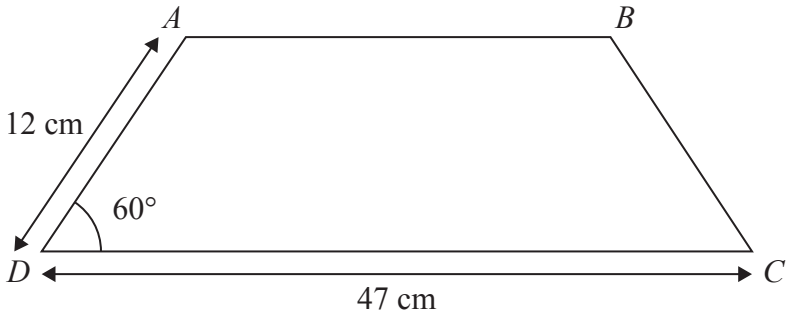


Diagram **NOT** accurately drawn

ABCD is a trapezium with one line of symmetry.

angle $ADC = 60°$ $AD = 12\,\text{cm}$ $DC = 47\,\text{cm}$

Work out the area of the trapezium.
Give your answer correct to 3 significant figures.
Show your working clearly.

..... cm^2

(Total for Question 10 is 5 marks)

11 (a) Expand and simplify $5x(5x + 4)(2x - 3)$

.....

(3)

(b) Express $\frac{9}{4} + \frac{y - 7}{5y}$ as a single fraction in its simplest form.

.....

(3)

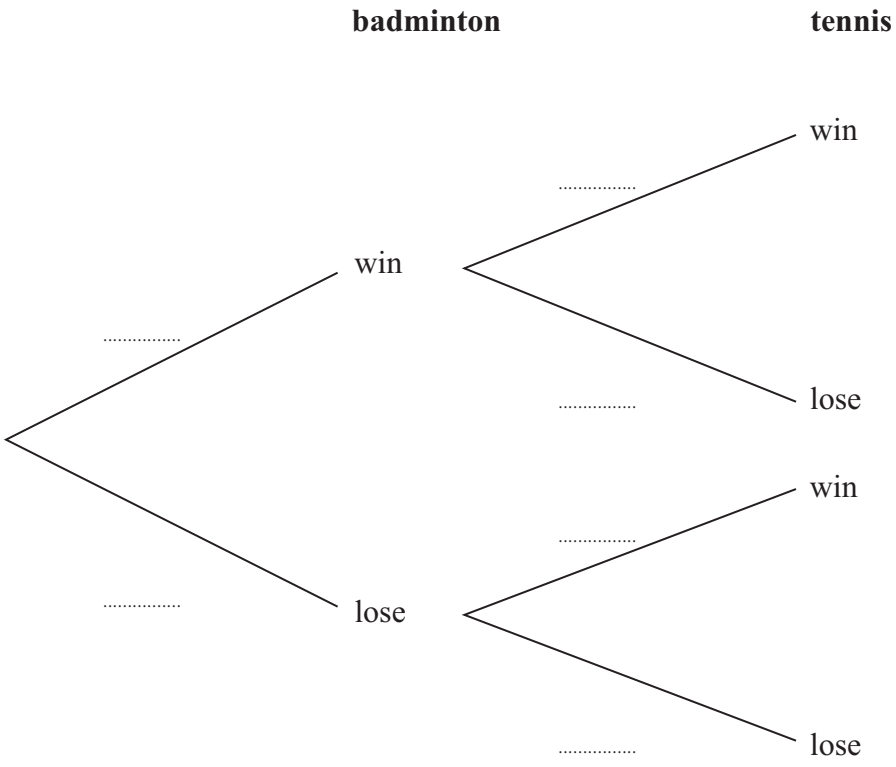
(Total for Question 11 is 6 marks)

12 Ricardo is going to play one game of badminton and one game of tennis.

He can either win or lose each game.

The probability that he will win the game of badminton is 0.7
The probability that he will win the game of tennis is 0.4

(a) Complete the probability tree diagram.



(2)

(b) Work out the probability that Ricardo loses both games.

.....

(2)

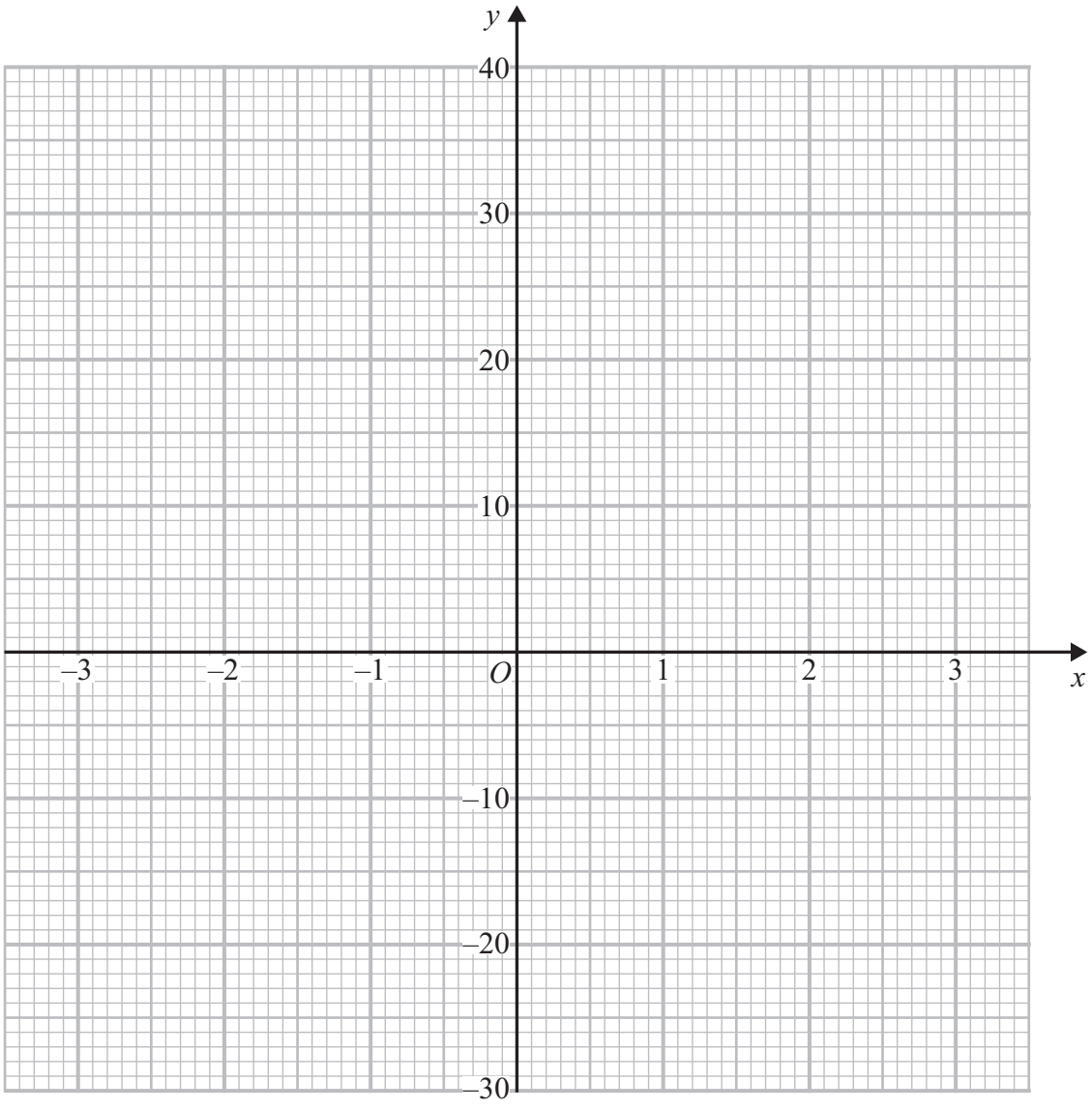
(Total for Question 12 is 4 marks)

13 (a) Complete the table of values for $y = x^3 + 2x + 3$

x	–3	–2	–1	0	1	2	3
y		–9	0	3	6		36

(1)

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



(2)

(Total for Question 13 is 3 marks)

14 The diagram shows sector OAB of a circle, centre O

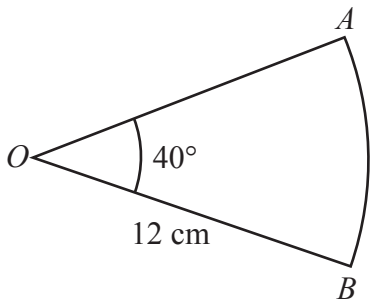


Diagram **NOT** accurately drawn

$OA = OB = 12$ cm angle $AOB = 40°$

(a) Work out the area of the sector.
Give your answer correct to 3 significant figures.

..... cm^2

(2)

The diagram shows triangle XYZ

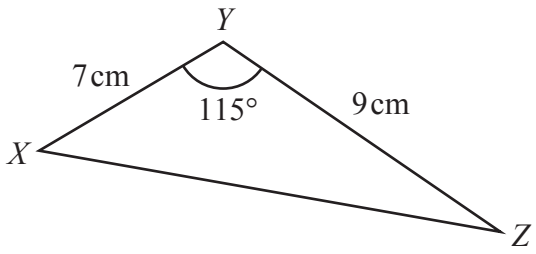


Diagram **NOT** accurately drawn

$XY = 7$ cm $YZ = 9$ cm angle $XYZ = 115°$

(b) Work out the area of the triangle.
Give your answer correct to 3 significant figures.

..... cm^2

(2)

(Total for Question 14 is 4 marks)

15 Solve the equation $5x^2 + 9x - 17 = 0$
Show your working clearly.
Give your solutions correct to 3 significant figures.

.....

(Total for Question 15 is 3 marks)

16 Solve the equation $8^{3y+4} \times 4^{3y} = 2^{5y}$
Show your working clearly.

$y =$ .....

(Total for Question 16 is 3 marks)

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

17 $(\sqrt{3})^5 = k\sqrt{3}$ where k is an integer.

(a) Find the value of k

$k =$ .....

(1)

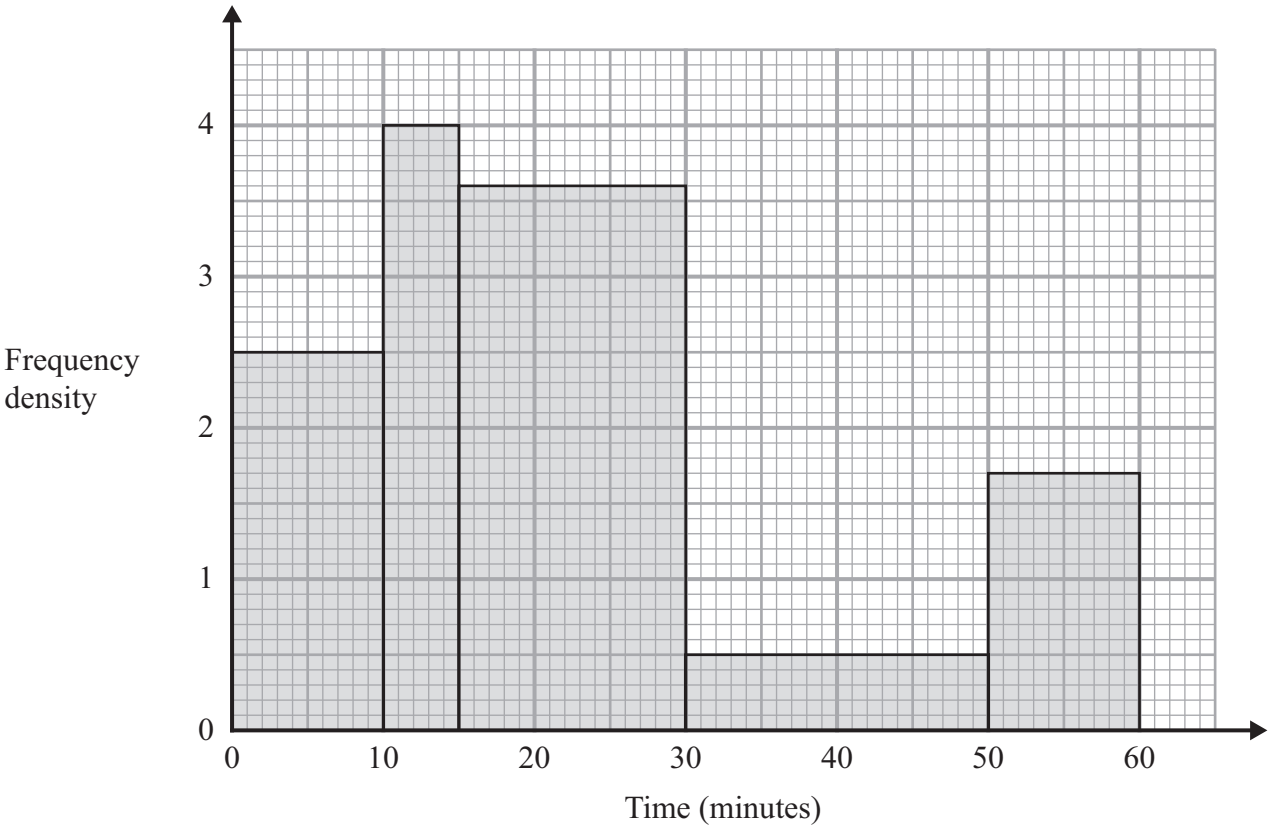
(b) Show that $\dfrac{21}{3-\sqrt{2}}$ can be written in the form $c + \sqrt{d}$

where c and d are integers.
Show each stage of your working clearly.

(3)

(Total for Question 17 is 4 marks)

18 The histogram shows information about the times, in minutes, that some people were in a shop.



Work out an estimate for the proportion of these people who were in the shop for more than 40 minutes.

.....

(Total for Question 18 is 3 marks)

19 Simplify fully $\dfrac{3x^2 - 3y^2}{5x + 5y} \div \dfrac{xy^2 - x^2y}{10xy}$

Show clear algebraic working.

.....

(Total for Question 19 is 3 marks)

20 Given that $k = m + n$ and $m = \dfrac{3}{4n}$

express $\dfrac{7k}{5 - m}$ in the form $\dfrac{a + bn^2}{cn - d}$ where a, b and c are integers and d is prime.

.....

(Total for Question 20 is 3 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

21

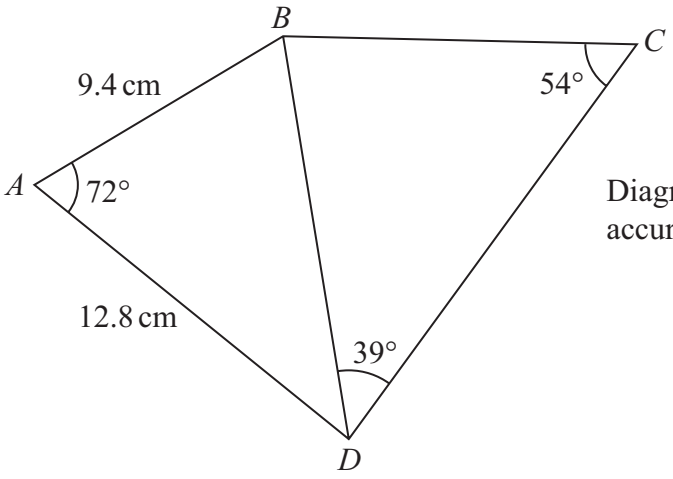


Diagram **NOT** accurately drawn

Work out the length of BC
Give your answer correct to 3 significant figures.

..... cm

(Total for Question 21 is 5 marks)

22 A box contains 20 counters.

9 of the counters are red
7 of the counters are yellow
4 of the counters are green

Alex takes at random three counters from the box.

Work out the probability that exactly two of the three counters are the same colour.

.....

(Total for Question 22 is 3 marks)

23 The diagram shows cuboid *ABCDEFGH*

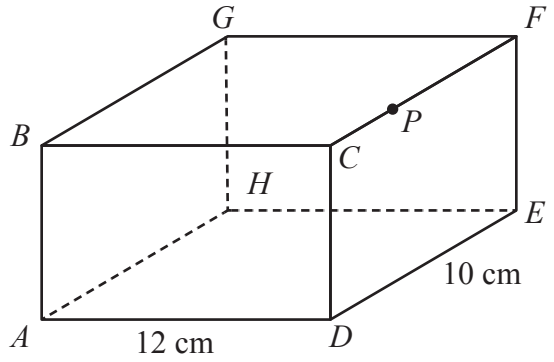


Diagram **NOT** accurately drawn

The point *P* lies on *CF*

$AD = 12$ cm $DE = 10$ cm $CP = 3$ cm

The angle of elevation of *P* from *A* is 24°

Calculate the size of angle *APG*
Give your answer correct to the nearest degree.
Show your working clearly.

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

.....°

(Total for Question 23 is 6 marks)

Turn over for Question 24

24 *PQRS* is a square.

PR is a diagonal of the square.

P is the point with coordinates (4, 7)
R is the point with coordinates (8, –5)

Find an equation of the straight line that passes through the points *Q* and *S*
Give your answer in the form $ay = bx + c$ where *a*, *b* and *c* are integers.

.....

(Total for Question 24 is 5 marks)

25 (a) Express $8 - 12x - 4x^2$ in the form $a - b(x + c)^2$
where a, b and c are constants.

.....

(3)

(b) Hence solve $8 - 12x - 4x^2 = 0$
Show your working clearly.
Give your solutions in surd form.

.....

(2)

(Total for Question 25 is 5 marks)

TOTAL FOR UNIT IS 100 MARKS

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

BLANK PAGE