Summer 2025

AQA Higher

Between Papers Practice (Paper 2 & 3)

Dr Frost LEARNING

This resource has been designed to support GCSE revision. The questions are from our Question Generators on drfrost.org.

This resource has been designed to aid with revision for the Summer 2025 exams, considering topics which commonly appear on the calculator papers and those which have already been examined in Paper 1. There is **no guarantee** that any topics assessed in Paper 1 will not appear again.

Hence, **this should not be considered as a predicted paper** and should not be relied upon for total preparation for Paper 2 or 3.

Teachers

With a Dr Frost subscription, this selection of questions can be found as a worksheet here or by using the QR code.

From this page you can set this as an online task/homework or create a shadow paper for further practice.

All exam practice resources for multiple exam boards in summer 2025 can be found here.

Students

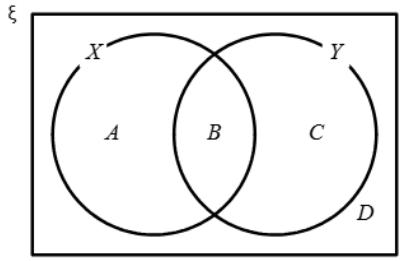
With a free Dr Frost account, you can compete this selection of questions online using the QR code & clicking 'Practice this Worksheet'.

The system will mark these automatically for you as you go and provide model solutions.

Question 1

$\xi = \{1,2,3,5,7,10,11\}$
$X = \{3,5,11\}$
$Y = \{1,5,11\}$

Complete the Venn diagram to represent this information.



$A = \{$ ..... $\}$

$B = \{$ ..... $\}$

$C = \{$ ..... $\}$

$D = \{$ ..... $\}$

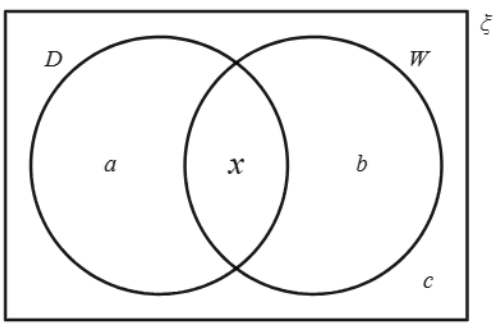
Question 2

Some dogs eat dry food (D) and some eat wet food (W).

In a group of dogs,

x eat both dry food and wet food
15 eat dry food
16 eat wet food
6 do not eat dry food or wet food

Complete the Venn diagram with this information.

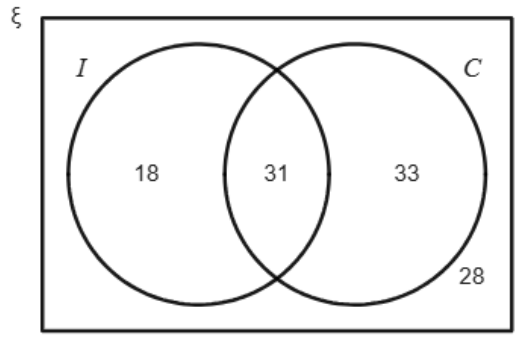


$a = \ldots\ldots, b = \ldots\ldots, c = \ldots\ldots$

Question 3

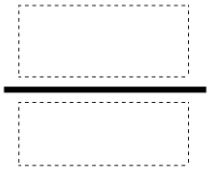
There are 110 pupils in a group.

The Venn diagram shows which languages they study from Italian and Chinese.



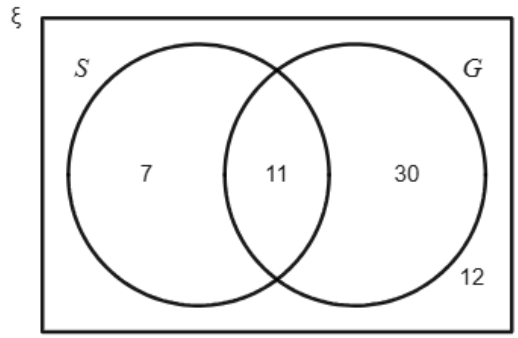
One pupil is chosen at random.

Find the probability that this pupil studies Chinese.



Question 4

60 pupils in a sports centre are surveyed, who use the swimming pool (S) and the gym (G), as shown on the Venn diagram below.

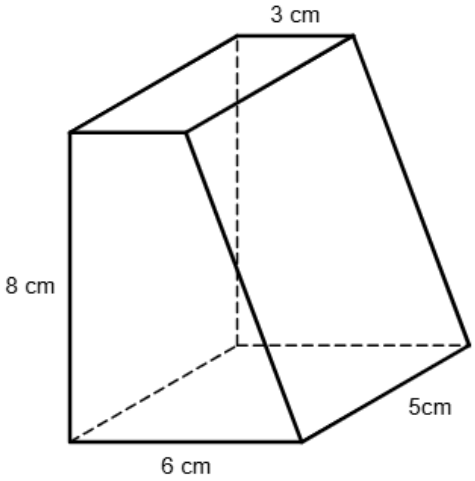


Find $P(S \cap G)$

$P(S \cap G) =$ .....

Question 5

The diagram below shows a prism.



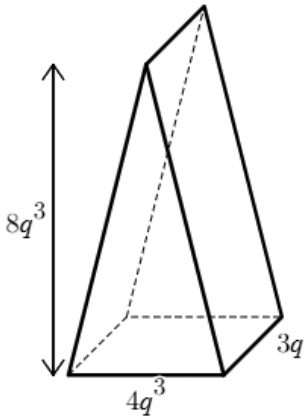
Calculate the volume of the prism.

..... cm^3

Question 6

A prism is drawn below.

The expressions for width, depth and height are given on the diagram.



Write an expression for the total volume of the prism.
Give your answer in its simplest form.

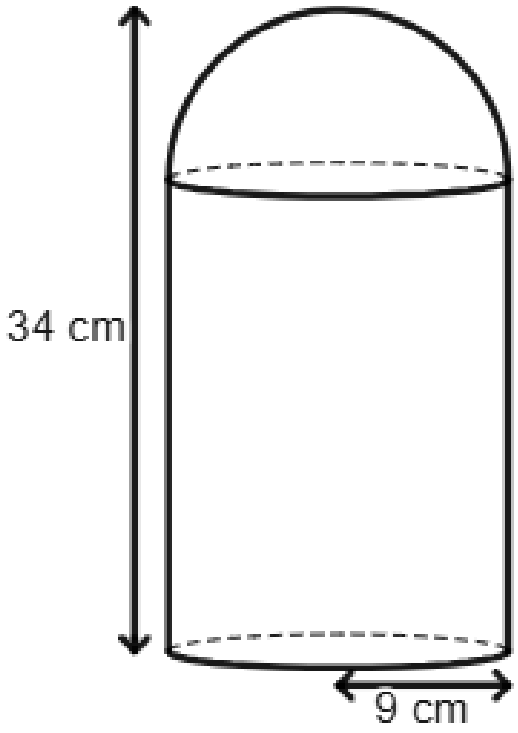
.....

Question 7

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

The diagram shows a storage jar.

The storage jar consists of a cylinder with a hemisphere on top.



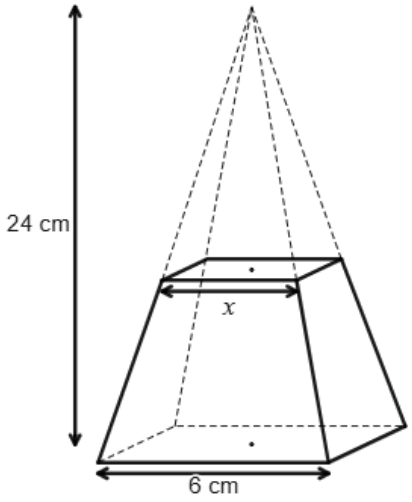
The height of the storage jar is 34 cm.
The radius is 9 cm.

Calculate the volume of the storage jar.
Give your answer in cm ^{3}, in terms of π.

..... π cm ^{3}

Question 8

A square based pyramid of width x cm is removed from a square based pyramid of width 6 cm and height 24 cm to give a frustum.



The volume of the frustum is 231 cm ^{3}.

Calculate the value of x.
Give your answer correct to 1 decimal place

$x =$ ..... cm

Question 9

Densy invests £2 325 into an account that pays 1.25% compound interest per annum.

Work out how much Densy will have in the account after 11 years.

£ .....

Question 10

Ellie buys a phone for £ 1200.

It decreased in value by 3% per year for 4 years, then decreased in value by 4.5% for 1 year.

Find the new value of the phone.

£ .....

Question 11

Ruby is planning on investing €500 into a savings account for 3 years. She is presented with the two options below.

Account A	**Account B**
Pays a fixed sum of €8 per year.	Pays compound interest of 3 % per year.

Determine which account will give Ruby the best value after 3 years.

Account A [ ]

Account B [ ]

Question 12

Martina invested €15000 into an account paying r % simple interest.

Amelie invested €15000 into an account paying 3 % compound interest.

After 3 years, Martina and Amelie's accounts both contain the same amount of money.

Calculate r.
Give your answer correct to 2 decimal places.

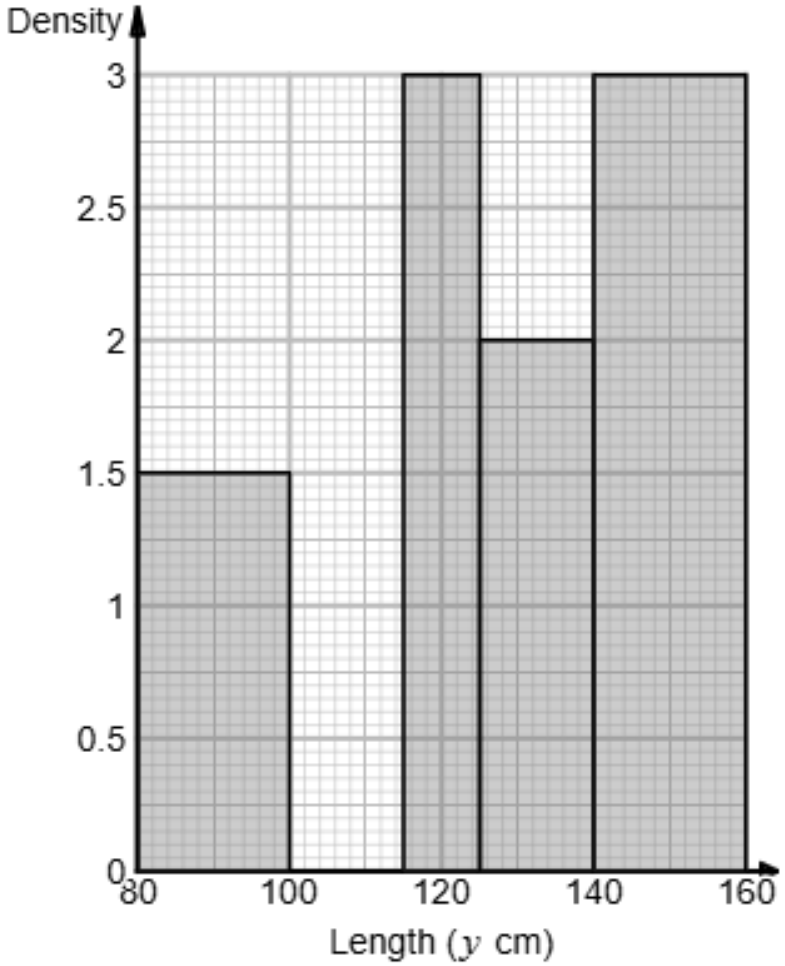
$r =$ .....

Question 13

Lloyd collects the lengths of 165 animals and records the data in the table below.

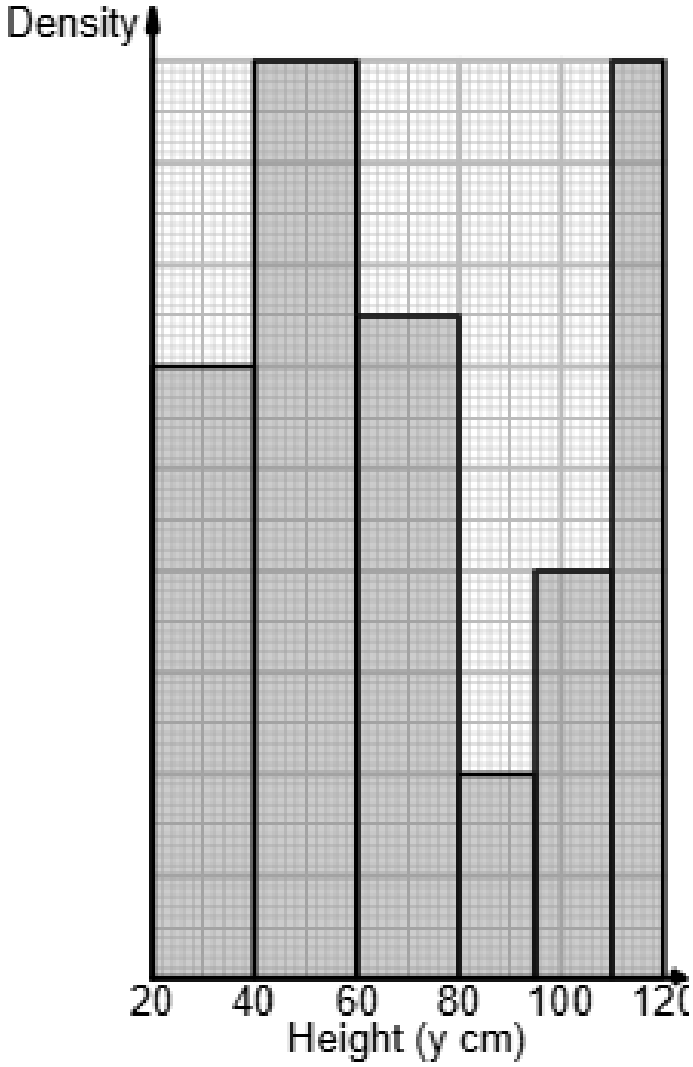
Complete the histogram for the data in the table.

Length (y cm)	Frequency
$80 < y \leq 100$	30
$100 < y \leq 115$	15
$115 < y \leq 125$	30
$125 < y \leq 140$	30
$140 < y \leq 160$	60



Question 14

Lesley collects the heights of some plants and represents the data on the histogram drawn below.



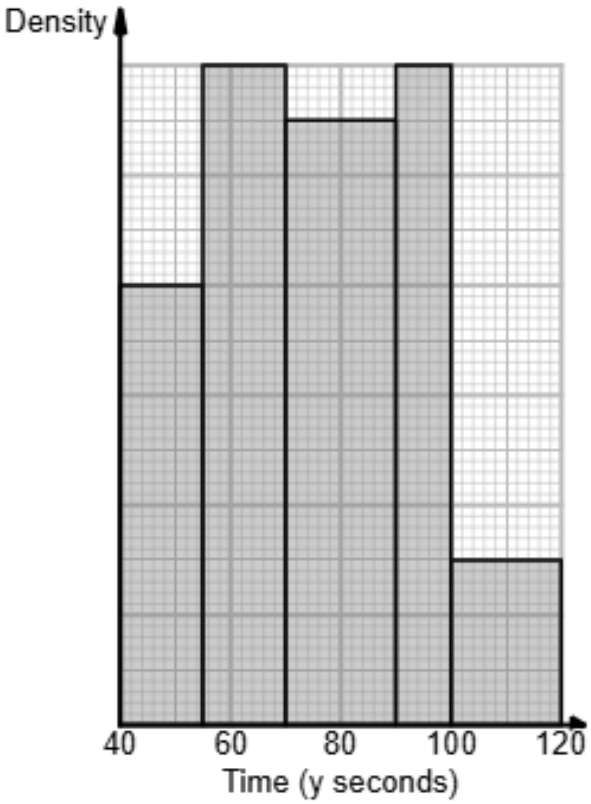
There are 45 plants with a height between 110 and 120 cm.

Estimate how many plants have a height between 40 and 80.

..... plants

Question 15

Lizzie collects the running times of some athletes and represents the data on the histogram drawn below.



There are 15 athletes with a time between 100 and 120 seconds.

Find the total number of athletes included in Lizzie's data.

..... athletes

Question 16

In a school there are 22 teachers and 400 students.
Of the students, 175 are boys.
One teacher, one girl and one boy are going to be chosen to represent the school.

Work out the number of different ways there are to choose one teacher, one girl and one boy.

.....

Question 17

There are 11 entrants in a cooking competition.

There will be prizes for the top four.

Work out how many different combinations there are for the first, second, third and fourth place finishers.

.....

Question 18

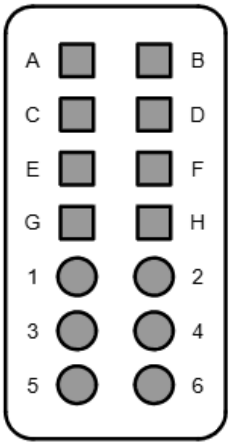
In a choir there are 20 different singers. Two are going to be picked to sing a duet.

Work out how many different ways they can pick two different singers.

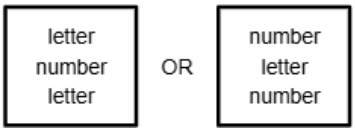
..... combinations

Question 19

A warehouse has a security lock.
To open the warehouse you must press the correct buttons.



Determine the probability that a code chosen at random containing any 3 characters is in one of the following orders:



Question 20

A bag contains 44 balls.
The ratio of red to green balls is $7 : 4$

Find how many red and green balls there are.

..... red balls

..... green balls

Question 21

Celeste, Jin and Ursula share a sum of money in the ratio $1 : 2 : 4$

Ursula got £24.

Work out the difference between the amount received by Celeste and Jin.

£ .....

Question 22

There are 900 people on a cruise ship.

The over 50 s and the 50 and unders are in the ratio $3 : 2$.
$\frac{9}{20}$ of the over 50 s are female.

Calculate how many of the over 50 s are male.

..... males over 50

Question 23

A train travels 108 miles in 63 minutes.
The train travels at a constant speed.

Find how far the train travels in 77 minutes.

..... miles

Question 24

Mahmoud is making some cakes.

He is using a recipe with the following ingredient list:

Ingredients for 4 cakes

190 g flour
180 g sugar
190 ml water
140 ml cream

Mahmoud wants to make 12 cakes.
He has 540 g sugar.

Determine whether he has more than enough, exactly enough, or not enough sugar.

Question 25

In a school, 2 classrooms are required if each class has 27 pupils.

How many classrooms would be required if the class size has reduced to 18?

..... classrooms

Question 26

k varies directly with y^2.

When $k = 36$, $y = 12$

Find a formula connecting k and y.

$k =$ .....

Question 27

p varies inversely with y.

When $p = 4, y = 4$

Find a formula connecting p and y.

$p =$ .....

Question 28

y varies inversely with the square of x.

When $y = 3$, $x = 1$.

Find the positive value of x when $y = \frac{3}{25}$

$x =$ .....

Question 29

a is directly proportional to $\sqrt[3]{b}$
b is directly proportional to c

Given that $a = 6$ and $c = 5$ when $b = 27$ find a formula for a in terms of c

$a =$ .....

Question 30

$m \propto \sqrt[3]{n}$

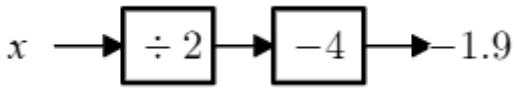
$m = 64$ when $n = 8d$

Find m when $n = d$

$m =$ .....

Question 31

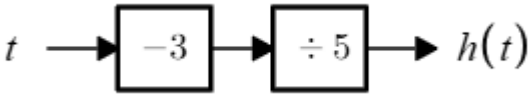
Find the input of the function machine, marked x on the diagram.



$x =$ .....

Question 32

Below is a function machine.

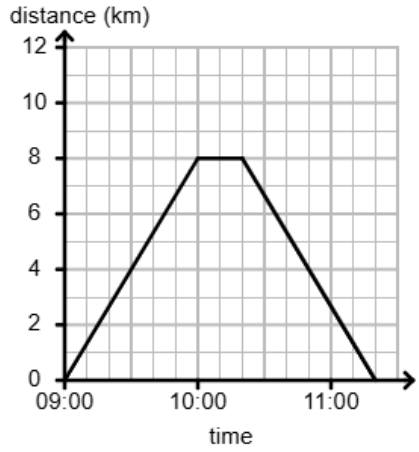


Find an expression for $h(t)$.

$h(t) =$ .....

Question 33

Beth sets off from home at 09:00 and travels 8 km in 60 minutes.
She stays at Densy's house for 20 minutes, then travels back home and arrives after 60 minutes.

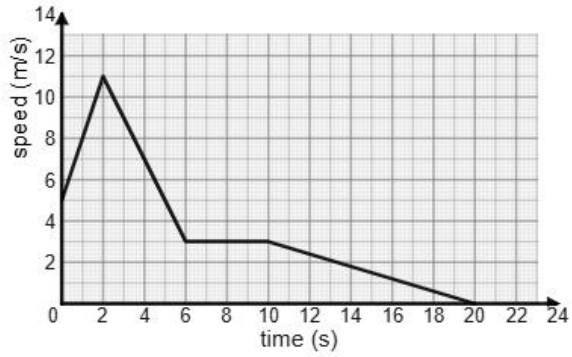


Find how far Beth is from Densy's house at 09:30.

..... km

Question 34

The graph shows the speed of a particle moving.



Calculate the acceleration between 0 and 2 seconds.

..... m/s ^{2}

Question 35

Convert $0.\dot{5}3\dot{1}$ to a fraction.
Give your answer in its simplest form.

$$\frac{\square}{\square}$$

Question 36

Calculate the value of

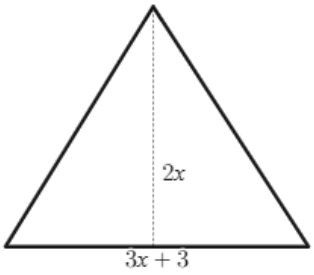
$$0.\dot{8} \div 0.0\dot{6}$$

Give your answer as a fraction in its simplest form.

$$\frac{\square}{\square}$$

Question 37

The diagram shows a triangle.



Write down an expression for the area of the triangle.

.....

Question 38

Solve for x:

$4x - 1 = 12$

$x =$ .....

Question 39

Solve to find x.

$7 = 9 - \frac{1}{2}x$

$x =$ .....

Question 40

Solve for x:

$\frac{11x}{3} = 4x + 6$

$x =$ .....

Question 41

A cinema ticket for a child costs £3.
A cinema ticket for an adult costs £x.

Diego buys 4 adult tickets and 3 child tickets.

The total cost is £53.

Find the cost of an adult ticket.

.....

Question 42

Solve for x:

$4\sqrt{x} = 80$

$x =$ .....

Question 43

Solve:

$64y^2 - 36 = 0$

$x =$ .....

or $x =$ .....

Question 44

Solve the following quadratic equation, giving your answer accurate to 2 decimal places:

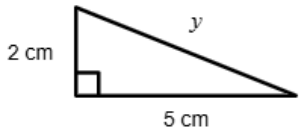
$2x^2 + 8x + 7 = 0$

$x =$ .....

or $x =$ .....

Question 45

Work out the value of y.

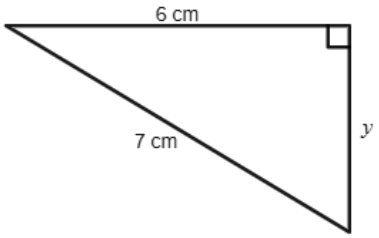


Give your answer correct to 1 decimal place.

$y =$ ..... cm

Question 46

Find the value of y.

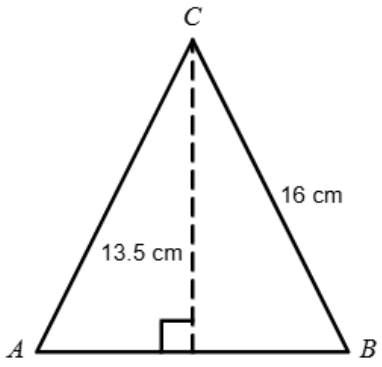


Give your answer correct to 1 decimal place.

..... cm

Question 47

The diagram below shows the isosceles triangle ABC.



Find the area of triangle ABC.

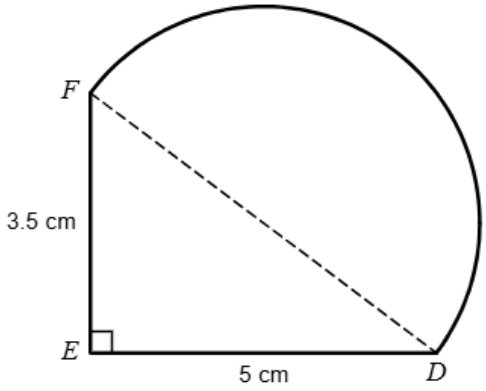
Give your answer to 1 decimal place.

..... cm^2

Question 48

The shape below consists of a right-angled triangle DEF and a semicircle.
DE has length 5 cm and EF has length 3.5 cm.

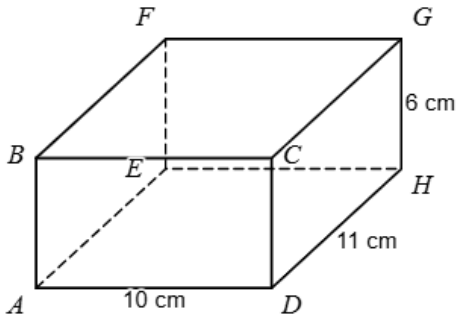
Calculate the perimeter of the shape.
Give your answer correct to 1 decimal place.



..... cm

Question 49

$ABCDEFGH$ is a cuboid.

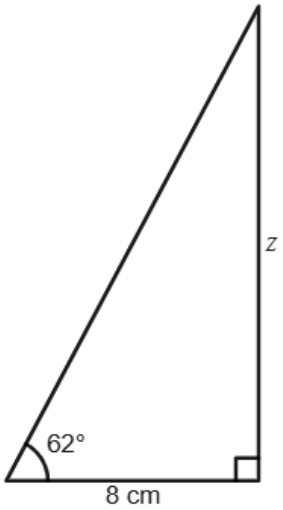


Find the length of EG.
Give your answer correct to 1 decimal place.

..... cm

Question 50

Determine the value of z in the diagram.

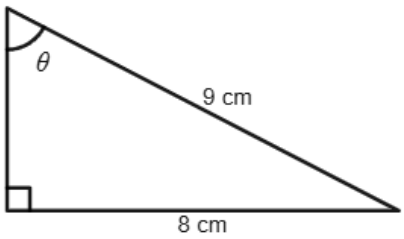


Give your answer correct to 1 decimal place.

$z =$ ..... cm

Question 51

Work out the value of θ.

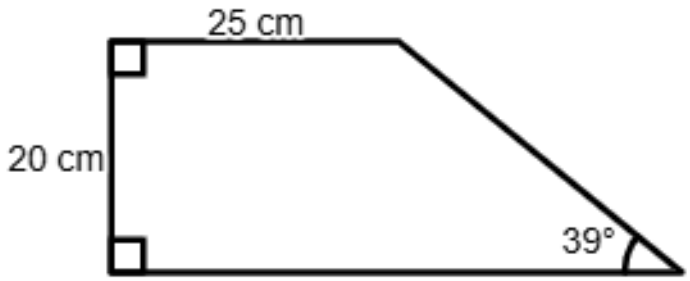


Give your answer correct to 1 decimal place where appropriate.

$\theta =$ ..... $^\circ$

Question 52

The diagram shows a trapezium.

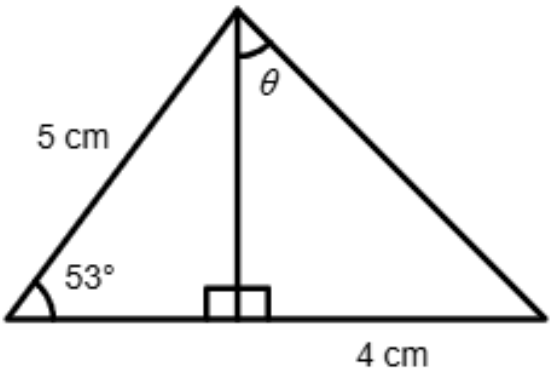


Determine the perimeter of the shape.
Give your answer correct to 1 decimal place.

..... cm

Question 53

Work out the value of θ.

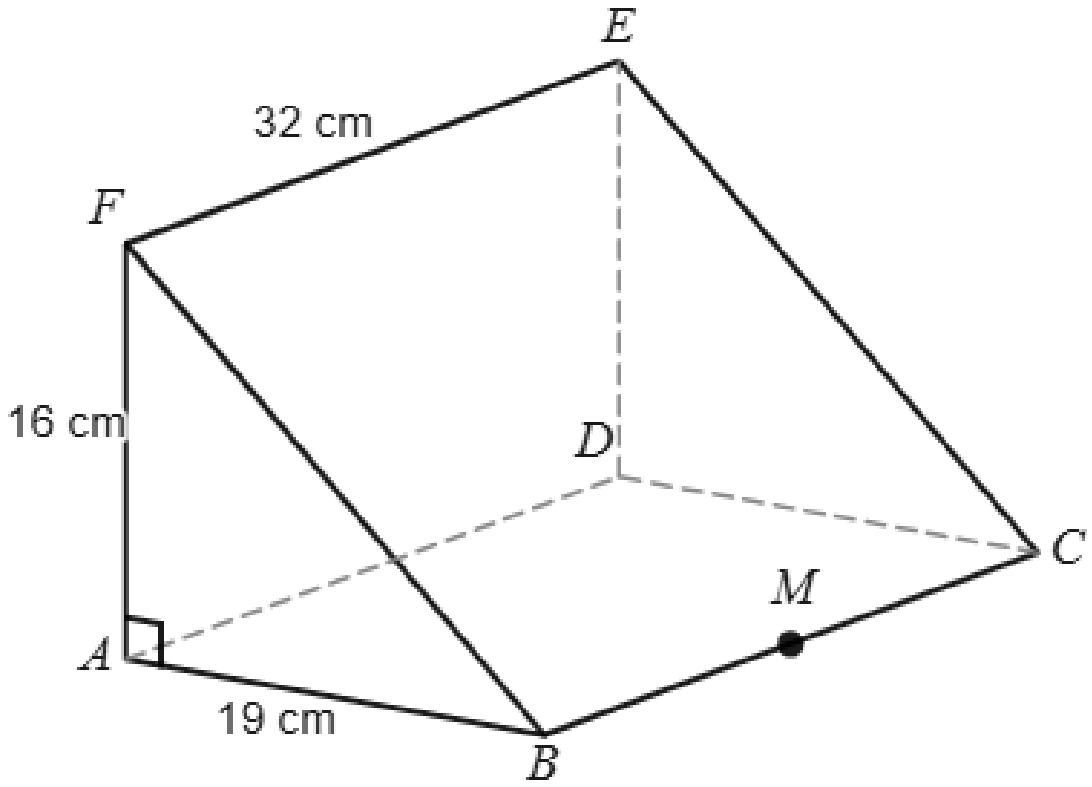


Give your answer correct to 1 decimal place.

$\theta =$ ..... °

Question 54

The diagram shows a triangular prism $ABCDEF$.



Angle $BAF = 90^{\circ}$.

$AB = 19$ cm, $FE = 32$ cm and $AF = 16$ cm.

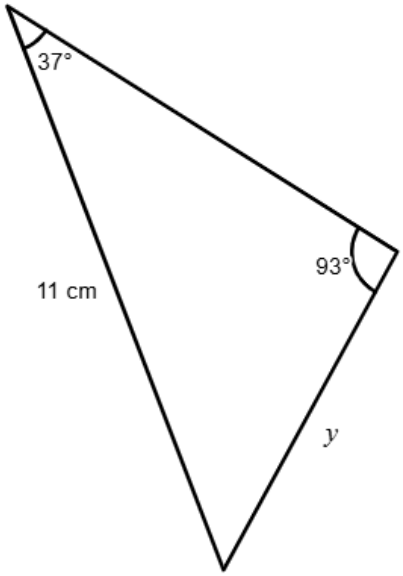
M is the midpoint of BC.

Calculate the size of angle between FM and the base $ABCD$.
Give your answer correct to one decimal place.

..... °

Question 55

Find the value of y.



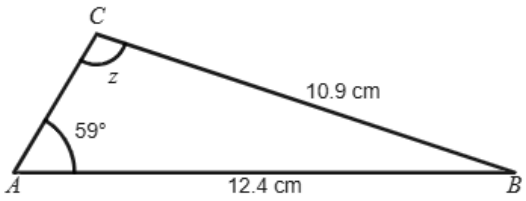
Give your answer correct to 1 decimal place.

$y =$ ..... cm

Question 56

The angle z is obtuse.

Find the value of z.

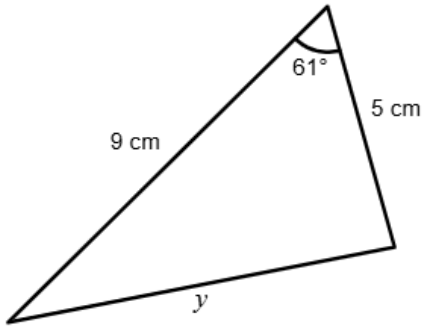


Give your answer correct to 1 decimal place.

$z =$ ..... °

Question 57

Find the value of y.



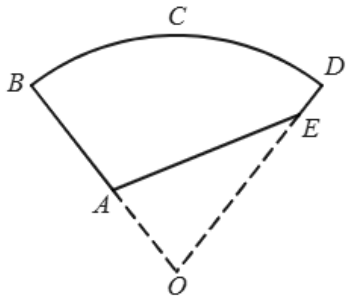
Give your answer correct to 1 decimal place.

$y =$ ..... cm

Question 58

The shape $ABCDE$ is made from a sector of a circle, centre O with a triangle AEO removed.

The arc length $BCD = 5.3$ cm.
The length $AE = 3.4$ cm.
Angle $AOD = 76^\circ$.
Angle $AEO = 30^\circ$.

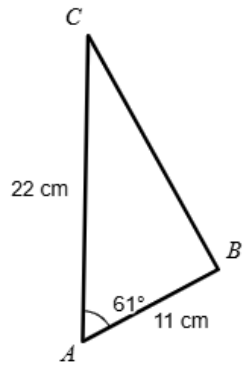


Calculate the perimeter of the shape.
Give your answer correct to 3 significant figures.

..... cm

Question 59

Find the area of the triangle ABC.

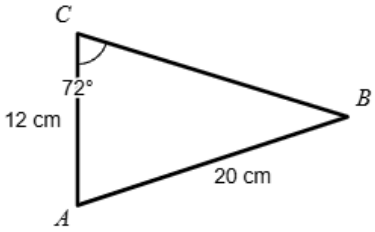


Give your answer correct to 1 decimal place.

..... cm ^{2}

Question 60

Find the area of the triangle ABC.



Give your answer correct to 1 decimal place.

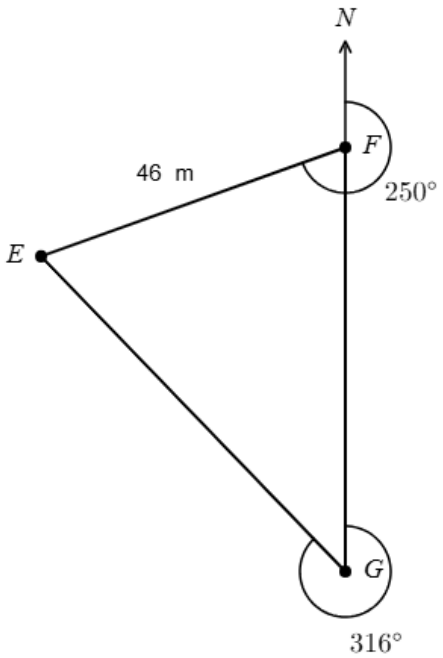
..... cm ^{2}

Question 61

The diagram shows the position of three hikers, E, F and G.

F is due north of G.

The bearing of E from G is 316°.
The bearing of E from F is 250°.
The distance between F and E is 46 m.



Find the distance between G and F.
Give your answer correct to one decimal place.

..... m

Question 62

Write

$$\left(6^9\right)^2$$

in the form 6^k where k is an integer to be found.

.....

Question 63

Simplify

x^0

.....

Question 64

Simplify

$\frac{x^2 \times x^9}{x^4}$

.....

Question 65

A number x, when rounded to 2 significant figures, is equal to 3800

Find the error interval for x.

.....

Question 66

$x = 4y + z$

$y = 96$ correct to 2 significant figures.
$z = 64.8$ correct to 3 significant figures.

Work out the lower bound for the value of x.
Give your answer correct to 3 decimal places when appropriate.

.....

Question 67

$x = \frac{\sqrt{y}}{z}$

$y = 0.57$ correct to 2 significant figures.
$z = 7.37$ correct to 2 decimal places.

By considering bounds, work out the value of x, giving your answer to a suitable degree of accuracy.

.....

Question 68

Aïcha collects the lengths of 100 animals and records the data in the table below.

Length (x cm)	Frequency
$10 < x \leq 15$	5
$15 < x \leq 20$	9
$20 < x \leq 25$	33
$25 < x \leq 30$	17
$30 < x \leq 35$	9
$35 < x \leq 40$	27

Complete the cumulative frequency table.

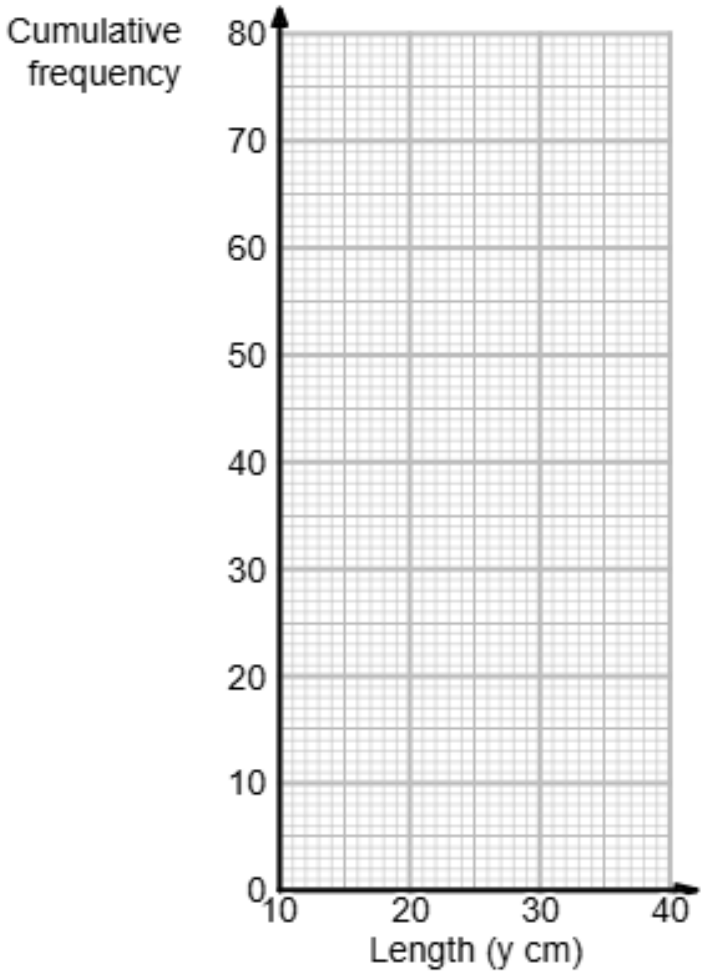
Length (x cm)	Cumulative Frequency
$10 < x \leq 15$	
$10 < x \leq 20$	
$10 < x \leq 25$	
$10 < x \leq 30$	
$10 < x \leq 35$	
$10 < x \leq 40$	

Question 69

Jenny collects the lengths of 80 animals and records the data in the table below.

Draw a cumulative frequency graph for the data in the table.

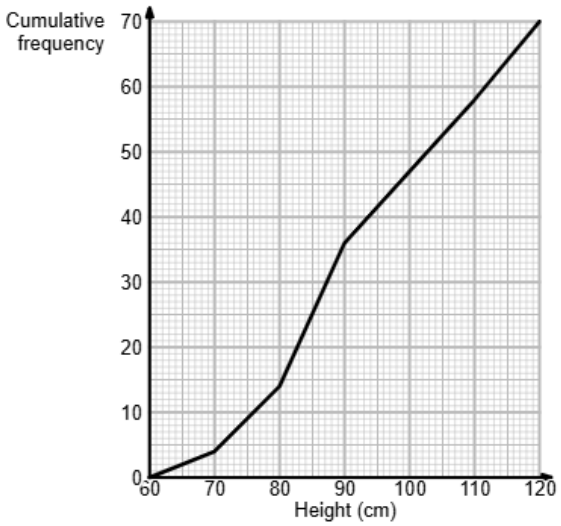
Length (y cm)	Frequency
$10 < y \leq 15$	7
$15 < y \leq 20$	12
$20 < y \leq 25$	24
$25 < y \leq 30$	12
$30 < y \leq 35$	8
$35 < y \leq 40$	17



Question 70

James collects the heights of some flowers and plots the values on the cumulative frequency graph below.

Use the cumulative frequency graph to estimate how many flowers have a height greater than 96 cm.



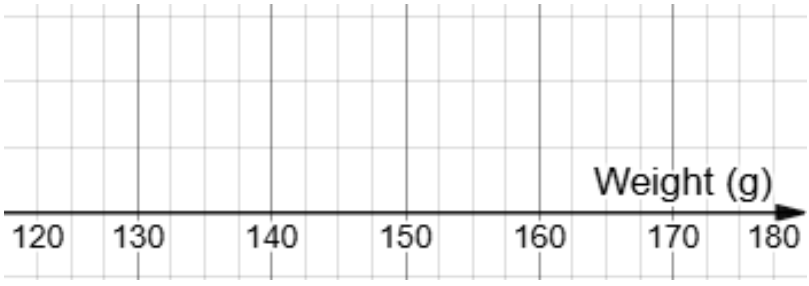
..... flowers

Question 71

Elliot recorded the weights of some tomatoes and calculate the statistics below.

Minimum	125
Lower Quartile	133
Median	139
Upper quartile	163
Maximum	175

Show this information on the box plot.



Question 72

Given that:

$$a = \begin{pmatrix} 4 \\ 7 \end{pmatrix}$$
$$b = \begin{pmatrix} 1 \\ 5 \end{pmatrix}$$
$$c = \begin{pmatrix} -7 \\ 6 \end{pmatrix}$$

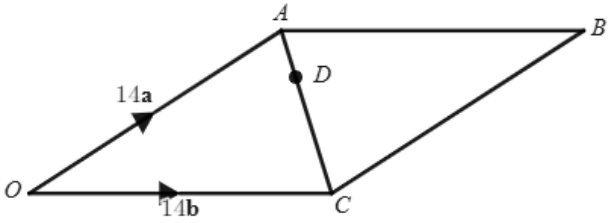
Write $2a - 2c + 3b$ as a column vector.

$2a - 2c + 3b = \begin{pmatrix} \cdots \\ \cdots \end{pmatrix}$

Question 73

$OABC$ is a parallelogram.
$\overrightarrow{OA} = 14a$
$\overrightarrow{OB} = 14b$

D is the point on AC such that $AD : DC = 2 : 5$.



Find, in terms of a and b, the vector $\overrightarrow{OD}$.

$\overrightarrow{OD} =$ .....

Question 74

Expand

$3y(2y - 3 - 5p)$

.....

Question 75

Expand and simplify

$6x(7x-2)-5x(3x+7)$

.....

Question 76

Expand and simplify:

$(x-5)^2$

.....

Question 77

Expand and simplify:

$(5a-4)(2a-1)(5-2a)$

.....

Question 78

Write

$7h(4h+3)+2h(h-9)$

in the fully factorised form $ah(bh+c)$ where a, b and c are integers to be found.

.....

Question 79

Factorise the following:

$3x^2+10x-8$

.....

Question 80

Find the nth term of the sequence.

$8, 16, 24, 32, \ldots$

nth term $=$ .....

Question 81

Here are the first five terms of a quadratic sequence

$7 \quad 18 \quad 35 \quad 58 \quad 87$

Find an expression, in terms of n, for the nth term of the sequence.

.....

Question 82

Find the Lowest Common Multiple (LCM) of 100 and 56.

.....

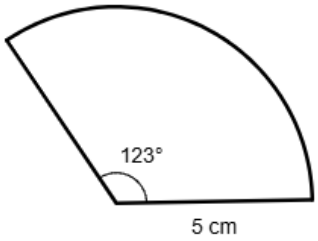
Question 83

Find the Highest Common Factor (HCF) of 54, 72, 30 and 12

.....

Question 84

Find the perimeter of the sector.

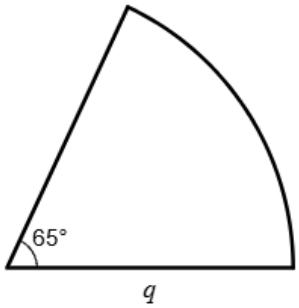


Give your answer correct to 1 decimal place.

..... cm

Question 85

Given that the area of sector below is 6 cm ^{2}, work out its radius, marked q on the diagram.

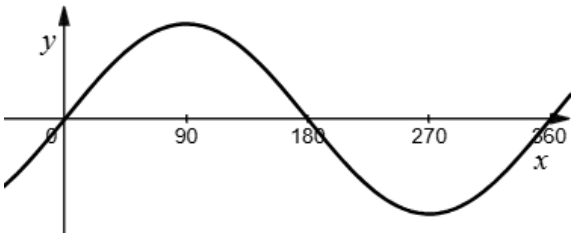


Give your answer correct to 1 decimal place.

$q =$ ..... cm

Question 86

Here is a sketch of $y = \sin x$ for $0^\circ \leq x \leq 360^\circ$



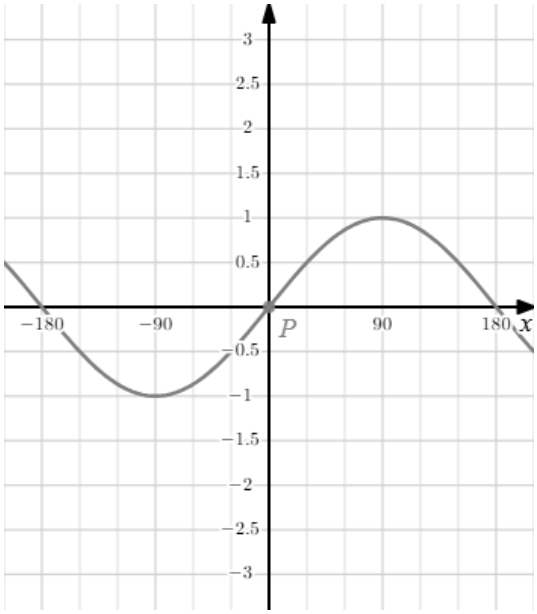
Write down how many solutions of $\sin x = 1$ there are in the range $90^\circ \leq x \leq 360^\circ$.

..... solution(s)

Question 87

The graph of $y = \sin x$ is sketched below.

Drag the point P to sketch the graph of $y = \sin(x) - 2$



Question 88

Given that n is an integer.

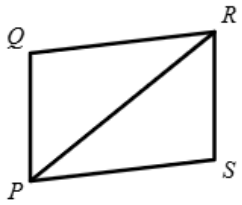
Prove that $(2n + 3)^2 + 10$ is always an odd number.

Question 89

Prove that $(3y + 1)(5y + 9) + (y + 1)(y + 7) - 8y$ is a perfect square.

Question 90

The diagram below shows a parallelogram $PQRS$.



Prove that triangle PQR and triangle PRS are congruent.

$PQ =$ ..... .

Angle $QPR =$ Angle ..... .

Reason: ..... .

Triangles PQR and PRS share side ..... .

Therefore using congruence condition ..... , triangles PQR and PRS are congruent.