

Yr11
Preparations

Effort

R

A

G

GCSE Maths

The only way
to **learn**
mathematics
is to **do**
mathematics.

Calculator Practice Booklet (F)

Name: _____

Paper 2 – Calculator

Week	Topics	R	A	G
Number				
1	Addition & Subtraction			
	Primes, Factors, Multiples			
	Square, Cube & Roots			
	Rounding			
	Fractions			
	Fractions, Decimals & Percentages			
	Percentage Increase / Decrease & Change			
	Money - Problem Solving			
	Calculator Calculations			
Algebra				
2	Forming & Solving			
	Inequalities			
	Plotting Graphs			
	Sequences			
Ratio & Proportion				
3	Simplifying & Comparing Ratios			
	Compound Measures			
Geometry				
4	Properties of 3D Shapes			
	Similarity & Congruence			
	Transformations			
	Trigonometry - SOH CAH TOA			
Statistics & Probability				
5	Probability of Events			
	Mutually Exclusive Events			
	Averages from Frequency Tables			
	Bar charts			
	Pie Charts			

Topics - Clip Number

Number

Addition & Subtraction

Question 1

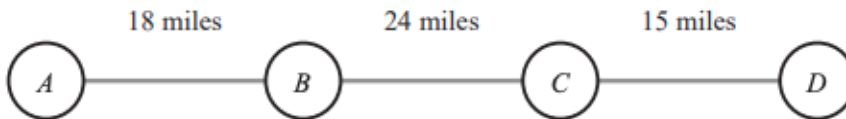
Write the missing digits to make this addition correct.

$$\begin{array}{|c|c|c|} \hline a & 2 & b \\ \hline \end{array} + \begin{array}{|c|c|} \hline c & 2 \\ \hline \end{array} = 200$$

.....

Question 2

The diagram shows four motorway service stations *A*, *B*, *C* and *D*.



The diagram also shows the distances between the service stations.





Work out the distance from *A* to *D*.

..... miles

(2 marks)

Question 3

A school shop sells these items.

<p>Pen</p>  <p>£1.25</p>	<p>Ruler</p>  <p>15p</p>	<p>Protractor</p>  <p>30p</p>	<p>Calculator</p>  <p>£1.20</p>
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A set has one pen, one ruler, one protractor and one calculator.

Work out the maximum number of sets that can be bought with £20

..... sets

Primes, Factors, Multiples

Question 4

Margaret is thinking of a number.

She says,

"My number is odd. It is a factor of 36 and a multiple of 3"

There are two possible numbers Margaret can be thinking of.

Write down these two numbers.

.....

.....

(3 marks)

Question 5

Doctor Jones starts an appointment every 20 minutes.

Doctor Warholm starts an appointment every 35 minutes.

The first appointment for both doctors starts at 8.30 am.

What is the next time that they have an appointment start at the same time?

..... am

(4 marks)

Question 6

Simon can see two lights, light **A** and light **B**.

Light **A** flashes every 15 seconds.

Light **B** flashes every 18 seconds.

At 10 pm, both lights flash at the same time.

How many **more** times will both lights flash at the same time in the next 4 minutes?

..... times

(3 marks)

Square, Cube & Roots

Question 7

Write down the cube root of 64

.....

Question 8

Work out $2^3 + \sqrt{144}$

.....

(2 marks)

Question 9

Find the square root of 3.24.

.....

(1 mark)

Rounding

Question 10

Round 0.005 694 to 3 significant figures.

.....

(1 mark)

Question 11

By writing each number correct to 1 significant figure, find an estimate for this calculation.

$$\frac{22.1 \times 37}{1.9}$$

.....

(3 marks)

Question 12

Ruth buys 19 identical tickets for £280.25.

Estimate the cost of one ticket.

£

(2 marks)

Fractions

Question 13

Work out $\frac{1}{8}$ of 720

.....

(1 mark)

Question 14

Work out $\frac{3}{8}$ of 240 kg.

.....

(2 marks)

Question 15

There are 180 people in a cinema.

$\frac{3}{5}$ of the people are adults. $\frac{1}{4}$ of the adults are female.

How many of the adults are female?

..... adults

(3 marks)

Fractions, Decimals & Percentages

Question 15

There are 180 people in a cinema.

$\frac{3}{5}$ of the people are adults. $\frac{1}{4}$ of the adults are female.

How many of the adults are female?

..... adults

(3 marks)

Question 16

Write 0.36 as a percentage.

..... %

(1 mark)

Question 17

Write 0.8 as a fraction.

Give your answer in its simplest form.

.....

(2 marks)

Percentage Increase / Decrease & Change

Question 18

Some students went to the cinema.

Each student watched film A or film B or film C. $\frac{3}{8}$ of the students watched film A.

40% of the students watched film B.

What fraction of the students watched film C?

.....

(3 marks)

Question 19

Claire buys a new car for £5700.

She pays a deposit of 12%

She then pays the rest of the cost in 15 equal monthly payments.

How much is each monthly payment?

£

(3 marks)

Question 20

Steph makes and sells birthday cakes. Each cake costs £54 to make.

She makes a profit of 15% on each cake.

What is the selling price of Steph's birthday cakes?

£

(2 marks)

Question 21

A television has a normal price of £675

In a sale the price is reduced by 32%.

Work out the price of the television in the sale.

£

(3 marks)

Question 22

Shari buys a box of 60 candles for £125.

She sells the candles for £2.25 each.

Calculate her percentage profit.

..... %

(4 marks)

Question 23

Helen's savings increased from £155 to £167.40.

Work out the percentage increase in Helen's savings.

..... % increase

(3 marks)

Money - Problem Solving

N/A

Calculator Calculations-N/A

Question 24

Use your calculator to work out

$$265 \times 89$$

.....

(1 mark)

Question 25

Use your calculator to work out the following.

$$\sqrt{334.89}$$

.....

(1 mark)

Question 26

Work out the value of

$$\frac{\sqrt{7.4}}{9.8 - 2.1}$$

Give your answer as a decimal.

Write down all the figures on your calculator display.

.....

(2 marks)

Algebra

Forming & Solving

Question 27

Solve

$$5m + 7 = 24$$

.....
(2 marks)

Question 28

Ali is y years old.

Bhavara is twice as old as Ali.

Ceris is 3 years younger than Ali.

The total of their ages is 125 years.

Work out the age of each person.

Ali

Bhavara

Ceris

(4 marks)

Question 29

The diagram shows a rectangle.

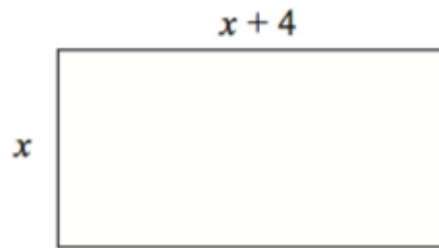


Diagram **NOT**
accurately drawn

All measurements are given in centimetres.

The perimeter of the rectangle is 45 cm.

Work out the value of x .

$x = \dots\dots\dots$ cm

(3 marks)

Question 30

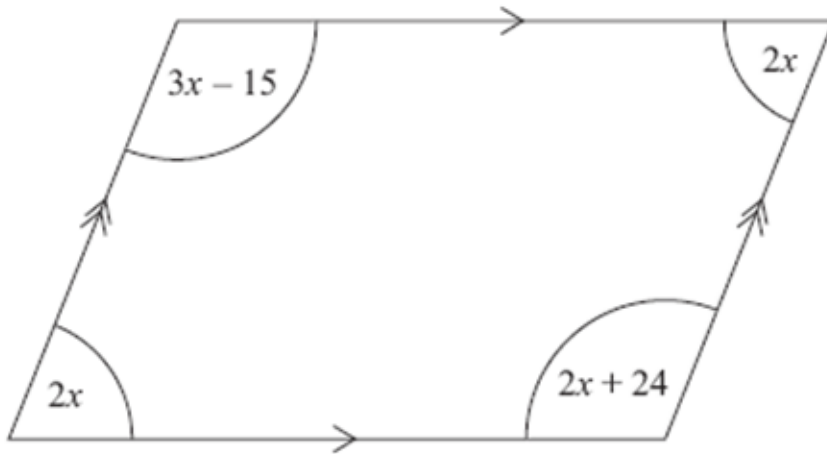


Diagram **NOT** accurately drawn

The diagram shows a parallelogram.

The sizes of the angles, in degrees, are

- $2x,$
- $3x - 15$
- $2x,$
- $2x + 24$

Work out the value of x .

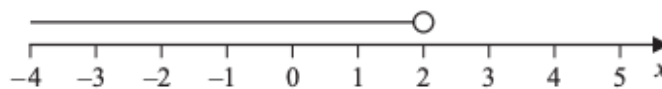
$x = \dots\dots\dots^\circ$

(3 marks)

Inequalities

Question 31

Write down the inequality shown in the diagram.

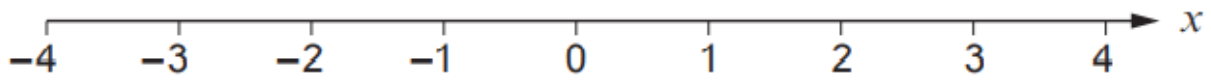


.....

(2 marks)

Question 32

Represent the inequality $-2 \leq x \leq 3$ on the number line below.



.....
(1 mark)

Question 33

Write down the whole numbers that satisfy

$$3 < 2n \leq 10$$

.....
(2 marks)

Question 34

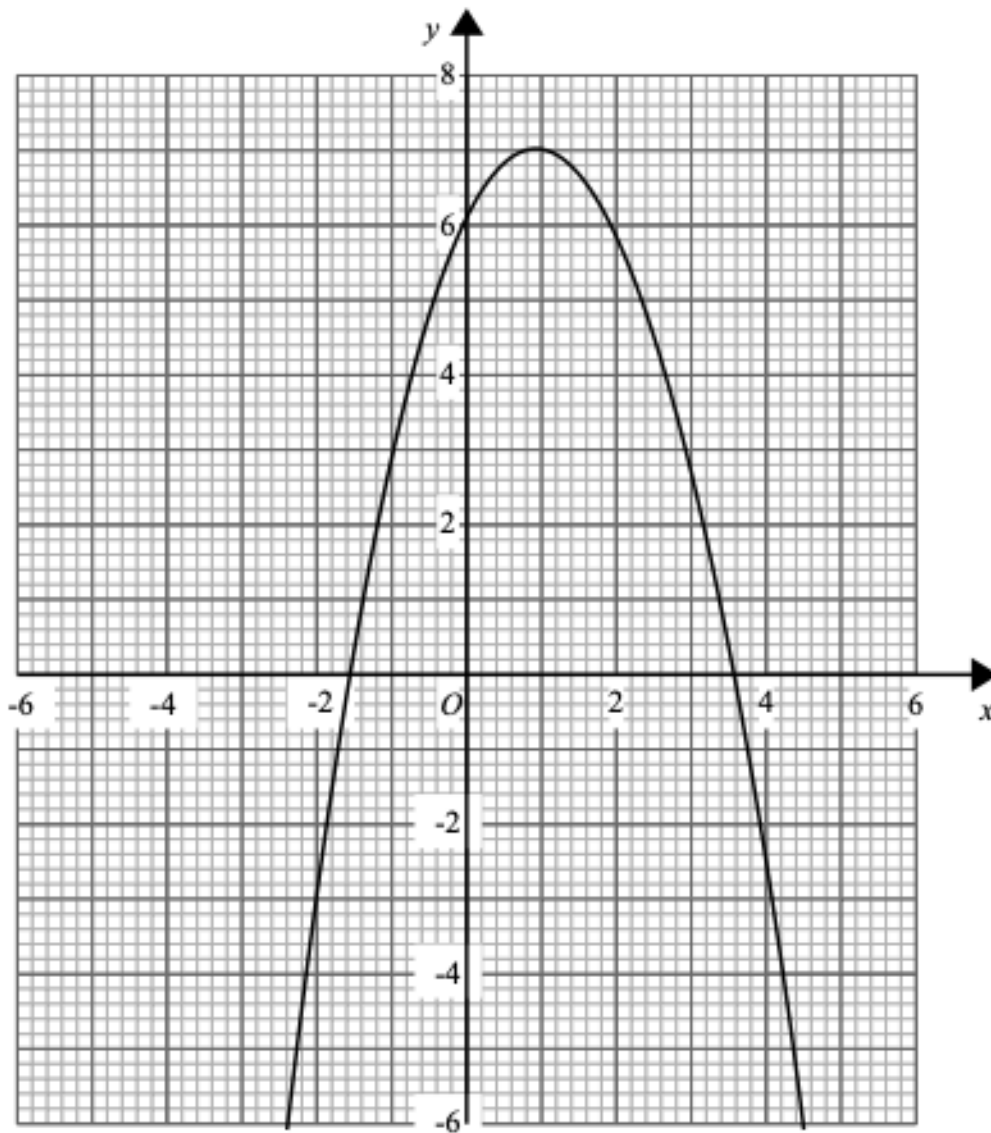
Solve

$$5y - 4 < 2y + 6$$

.....
(2 marks)

Plotting Graphs

Here is the graph of $y = 2x + 6 - x^2$



(a) Write down the turning point of the graph $y = 2x + 6 - x^2$

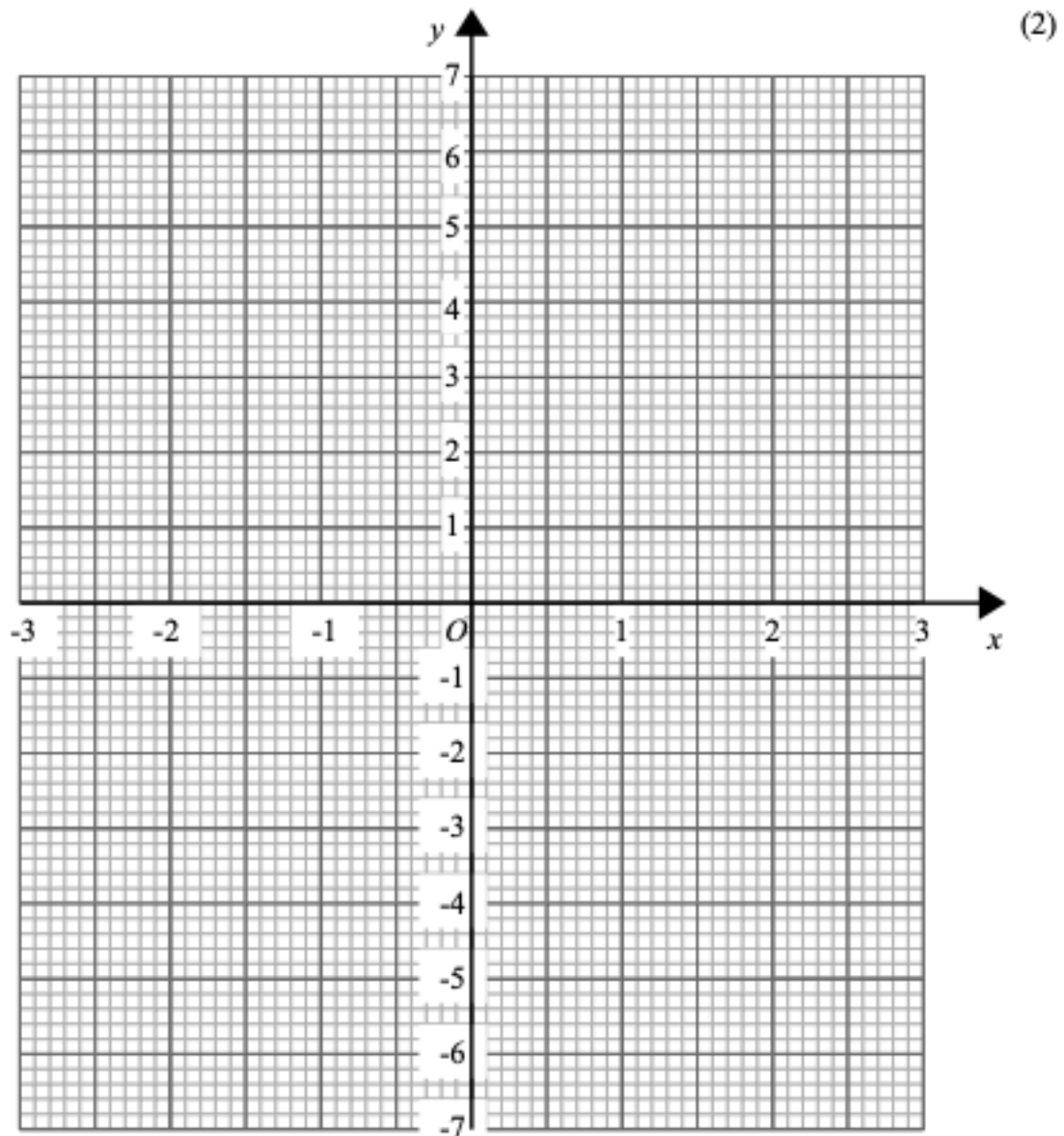
(.....,)
(1)

(b) Use the graph to find the roots of the equation $x^2 = 2x + 6$

.....
(2)

Complete the table of values for $y = x^2 + x - 6$

x	-3	-2	-1	0	1	2	3
y				-6		0	



(a) On the grid draw the graph of $y = x^2 + x - 6$ for values of x from -3 to 3 (2)

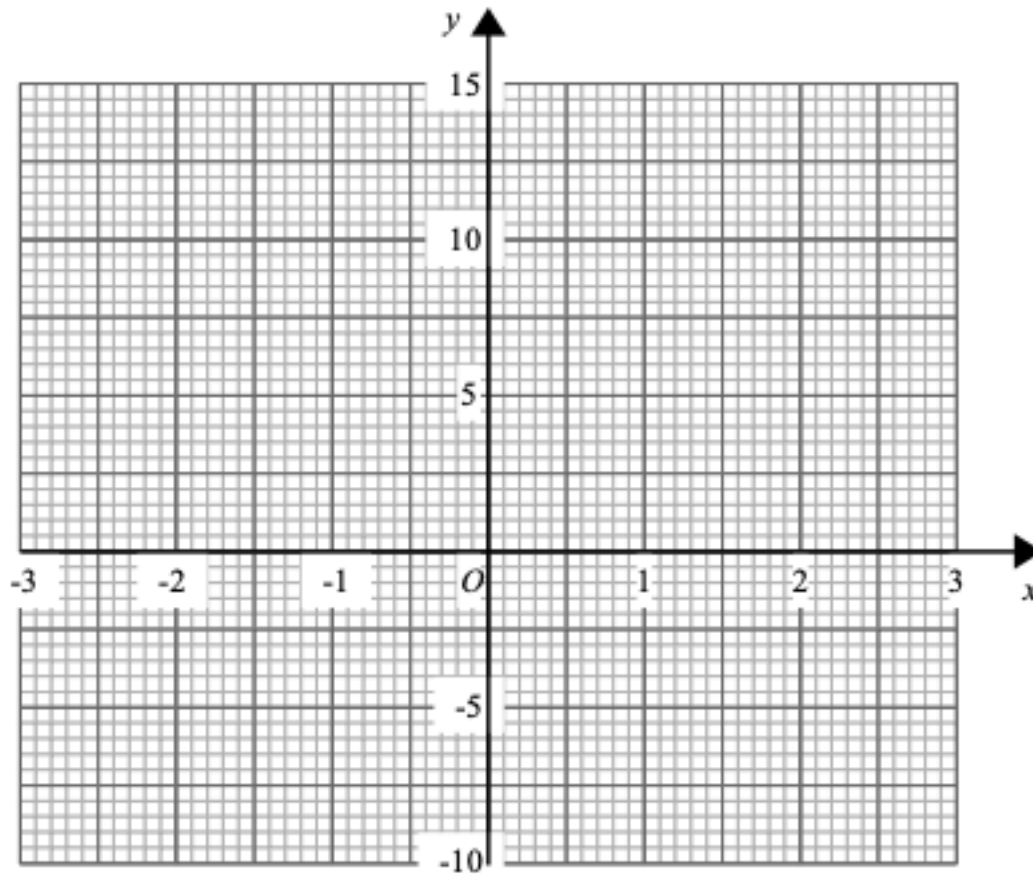
(b) Use the graph to find estimates of the solutions to the equation $x^2 + x - 6 = -2$

.....
(2)

Complete the table of values for $y = x^2 - 2x - 5$

x	-3	-2	-1	0	1	2	3
y							

(2)



(a) On the grid draw the graph of $y = x^2 - 2x - 5$ for values of x from -3 to 3 (2)

(b) Use the graph to find an estimate of a solution to the equation $x^2 = 2x + 5$

.....
 (1)

Sequences

Question 35

Here are the first five terms of a number sequence S .

10 16 22 28 34

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

n th term =

(2 marks)

Question 36

Here are the first five terms of an arithmetic sequence.

26 19 12 5 -2

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

n th term =

(2 marks)

Question 37

The n th term of a sequence is $3n + 4$

Is 21 a term of this sequence?

Yes

No

(2 marks)

Ratio & Proportion

Simplifying & Comparing Ratios-328 - 329

Question 38

There are some sweets in a bag.

18 of the sweets are toffees.

12 of the sweets are mints.

Write down the ratio of the number of toffees to the number of mints.

Give your ratio in its simplest form.

..... :

(2 marks)

Question 39

Lucy and Ben share £42.

Lucy's share is £30.

Write the ratio Lucy's share : Ben's share in its simplest form.

..... :

(2 marks)

Question 40

The lengths of the sides of a triangle are in the ratios 2 : 6 : 7

The length of the longest side of the triangle is 24.5cm.

Work out the perimeter of the triangle.

..... cm

(3 marks)

Compound Measures

Question 41

The distance by rail from Leicester to London is 100 miles.

Assume that the train travels at an average speed of 80 mph.

The train actually travelled slower than the assumed 80 mph.

How would this affect the arrival time?

.....
(1 mark)

Question 42

Abelie flew by plane from Dubai to Rome.

The flight time was 6 hours 42 minutes.

The average speed of the plane was 650 kilometres per hour.

Work out the distance the plane flew.

..... kilometres
(3 marks)

Question 43

A car travels at an average speed of 45 mph for 40 minutes.

The next part of the car journey takes 25 minutes at an average speed of 60 mph.

What is the average speed of the entire journey?

Round your answer to the nearest whole number

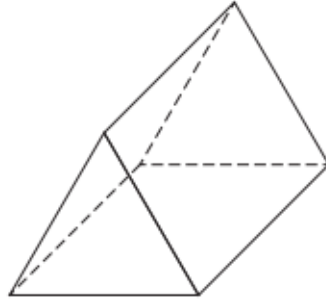
..... mph
(5 marks)

Geometry

Properties of 3D Shapes

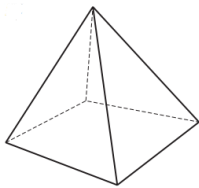
Question 44

Write down the mathematical name of this 3-D shape.

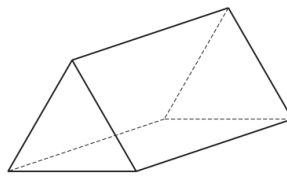


.....
(1 mark)

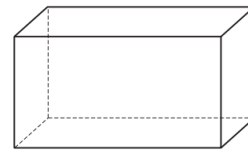
Question 45



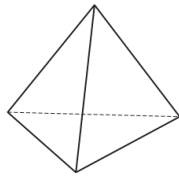
A



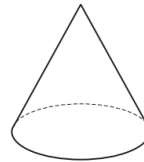
B



C



D



E

Which of the 3D shapes drawn above has 5 faces, 9 edges and 6 vertices?

A

B

C

D

E

(1 mark)

Similarity & Congruence

Question 46

A factory sells paint in different size tins.



Diagram not drawn to scale

The square label on a small tin has a height of 6cm.
The square label on a large tin has a height of 15cm.

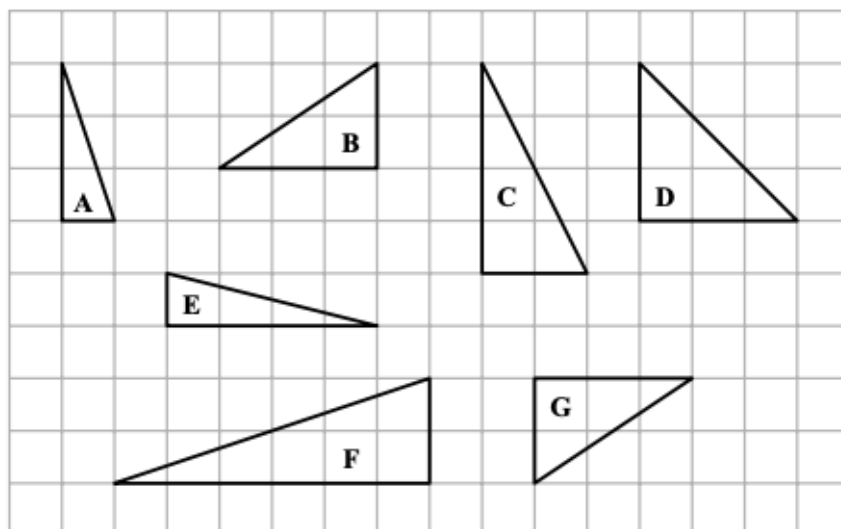
Complete the following statement:

The large label is an enlargement of the small label using a scale factor of

(1 mark)

Question 47

Here are seven triangles drawn on a square grid.

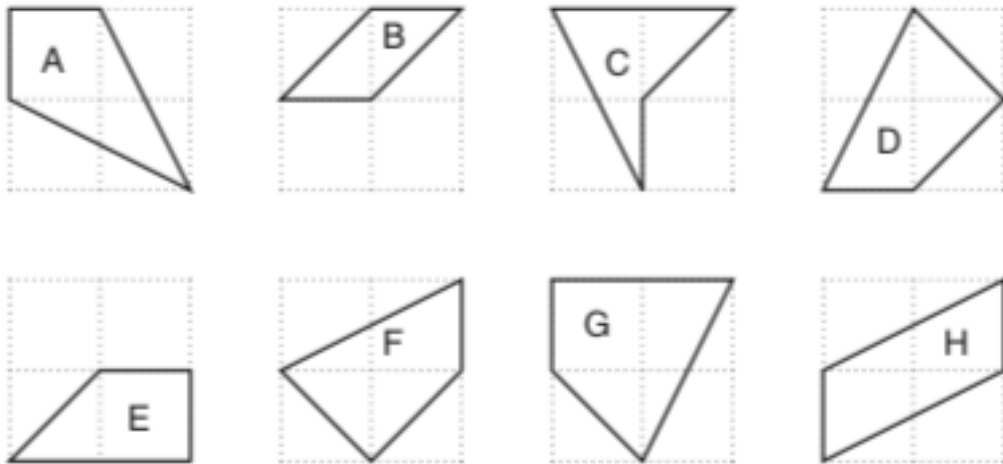


Select the letters of the two triangles that are congruent.

(1 mark)

Question 48

Jason draws some quadrilaterals on square grids.



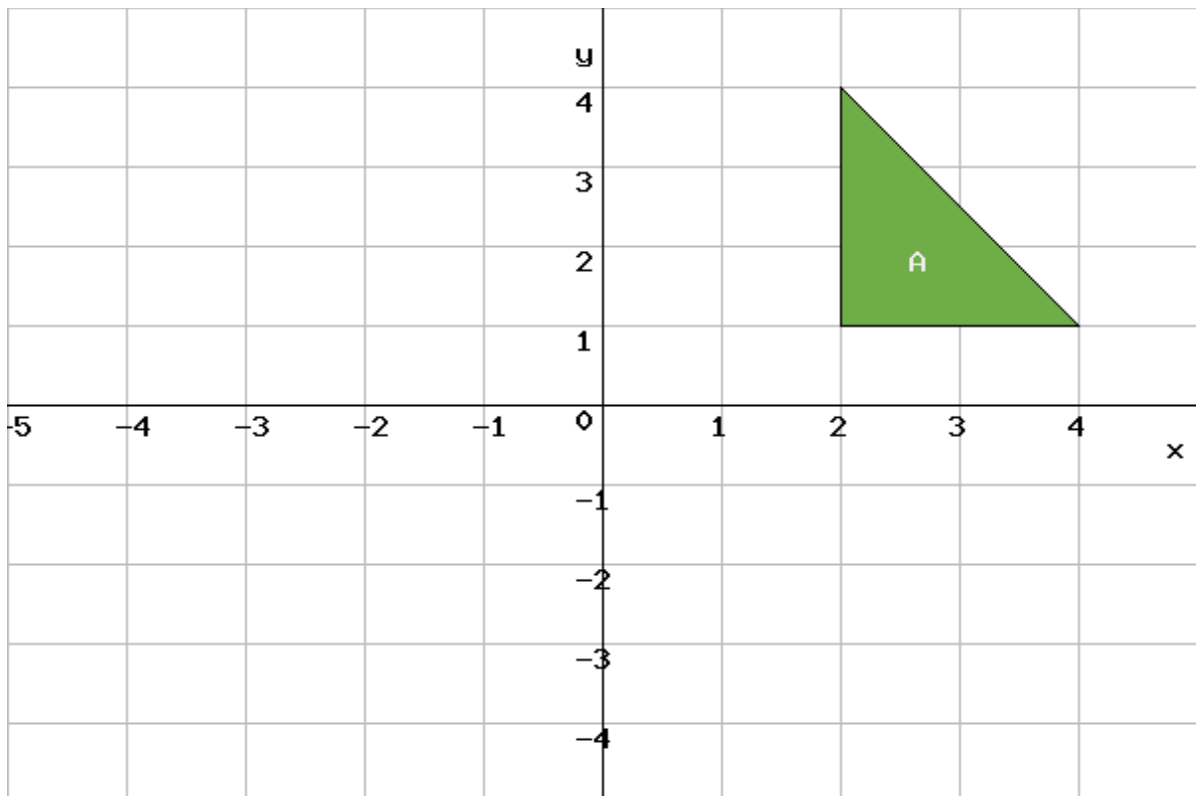
Which two quadrilaterals are congruent?

(1 mark)

Transformations

Question 49

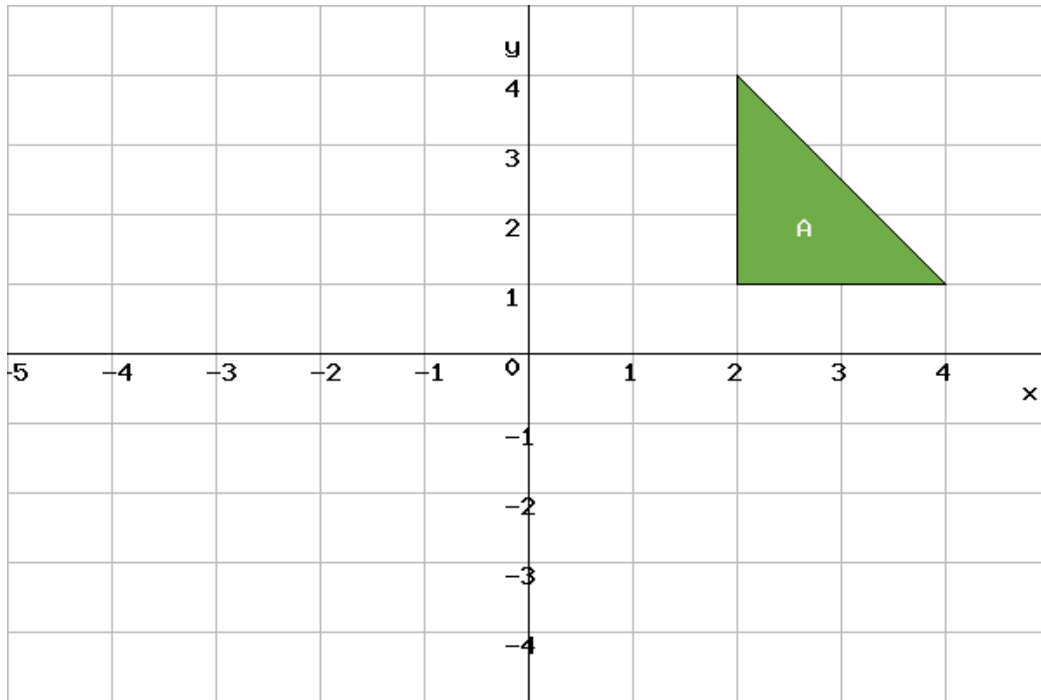
Translate triangle A by the vector $\begin{pmatrix} -4 \\ -5 \end{pmatrix}$



(1 mark)

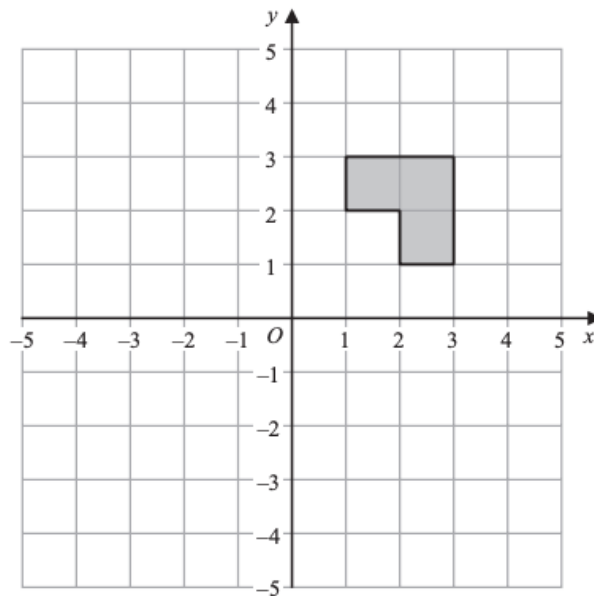
Question 50

Reflect triangle **A** in the y -axis.



(2 marks)

Question 51



The shaded shape is rotated 180° about the point $(2, 2)$

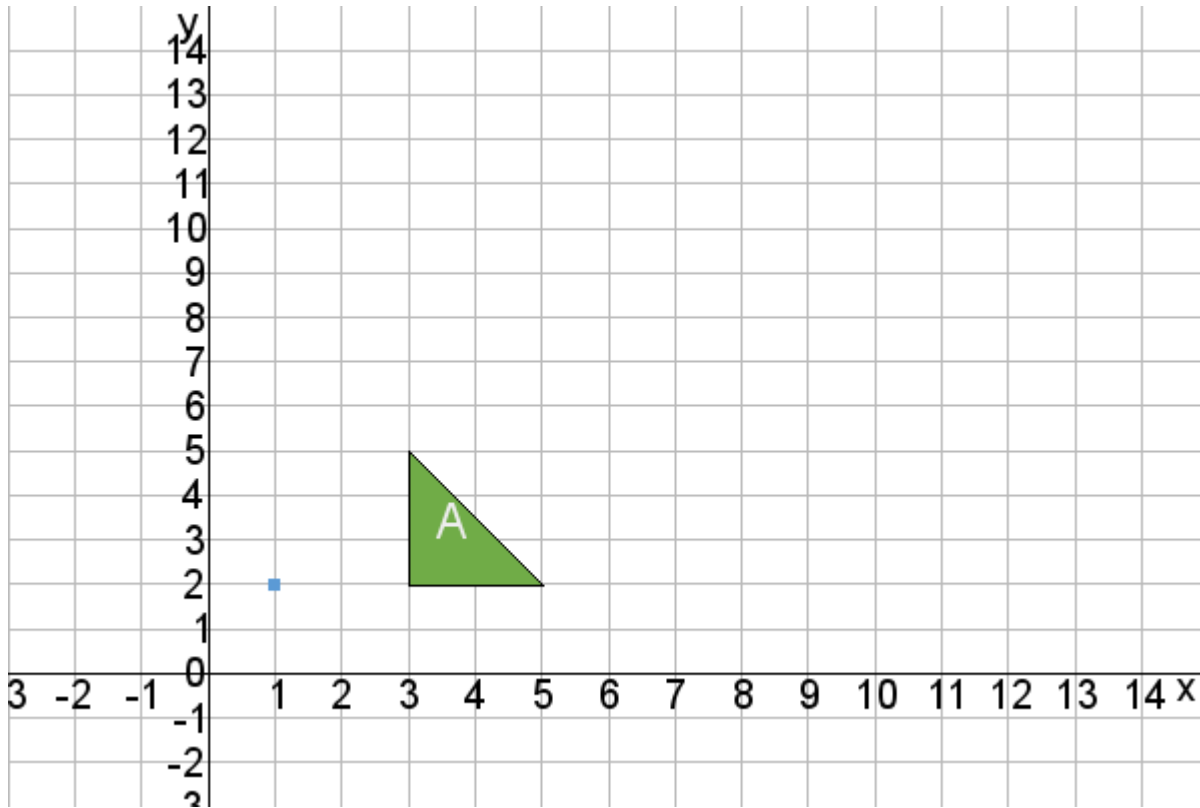
How many of the vertices of the shaded shape are invariant?

..... vertex/vertices

(1 mark)

Question 52

Enlarge triangle A by scale factor 3, centre (1, 2).

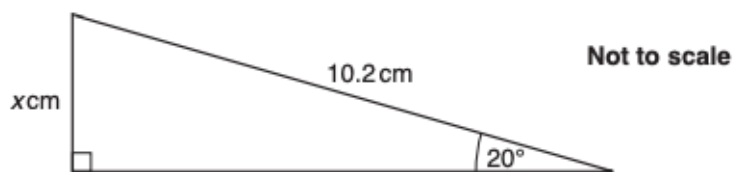


(3 marks)

Trigonometry - SOH CAH TOA

Question 53

Here is a right-angled triangle.



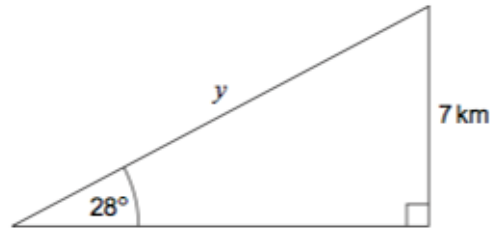
Use trigonometry to work out the value of x .

$x = \dots\dots\dots$ cm

(3 marks)

Question 54

An aircraft flies y kilometres in a straight line at an angle of elevation of 28° .
The gain in height is 7 kilometres.



Not drawn accurately

Work out the value of y .

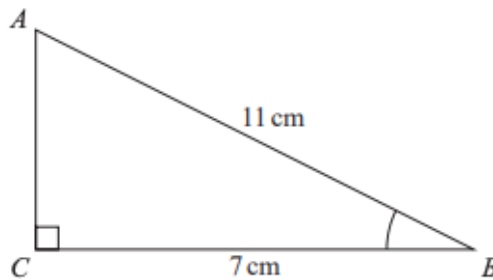
Input note: give your answer correct to 3 significant figures.

$y = \dots\dots\dots$ km

(3 marks)

Question 55

ABC is a right-angled triangle.



Work out the size of angle ABC .

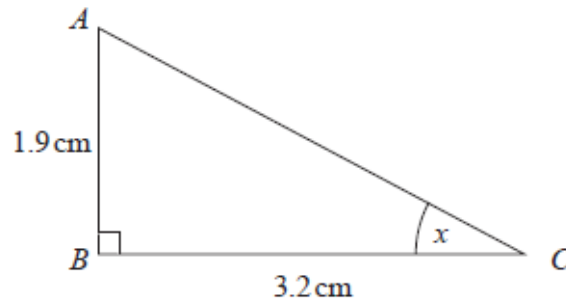
Give your answer correct to 1 decimal place.

$\dots\dots\dots^\circ$

(2 marks)

Question 56

ABC is a right-angled triangle.



Work out the size of the angle marked x .
Give your answer correct to 1 decimal place.

..... °
(2 marks)

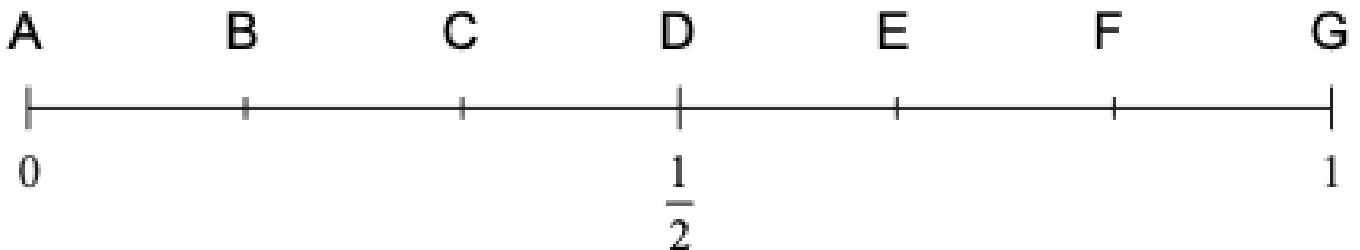
Statistics & Probability

Probability of Events

Question 57

Lukas has a fair ordinary dice.
Lukas rolls the dice once.

On the probability scale below, mark with a cross (\times) the probability that Lukas gets the number 2



Question 58

The table below shows the number of pets seen by the vet on Wednesday.

Type of pet	Frequency	Frequency
Cat		10
Dog		17
Rabbit		9
Bird		12
Total		48

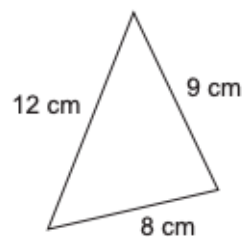
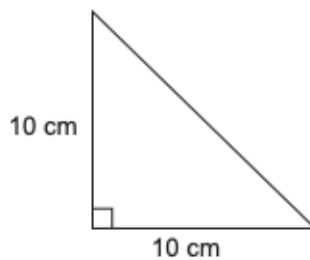
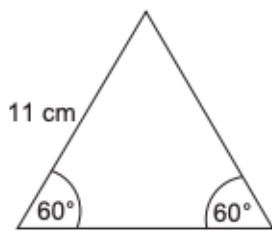
A pet is chosen at random from the pets that were seen on Wednesday.

What is the probability that this pet is a dog?

.....
(2 marks)

Question 59

One of these triangles is picked at random.



Not drawn accurately

Work out the probability that its perimeter is less than 30 cm

.....
(3 marks)

Mutually Exclusive Events

Question 60

Simon is playing a game.

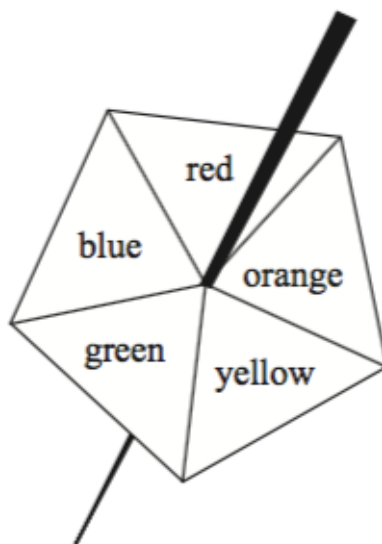
The probability that he wins the game is 0.7.

What is the probability that Simon does not win his game?

.....
(1 mark)

Question 61

Here is a biased five-sided spinner.



When the spinner is spun, it can land on red, orange, yellow, green or blue.

The probabilities that it lands on red, orange and yellow are given in the table.

Colour	red	orange	yellow	green	blue
Probability	0.4	0.2	0.1		

The probability that the spinner lands on green is the same as the probability that the spinner lands on blue.

Michael spins the spinner once.

Work out the probability that the spinner lands on green.

.....
(3 marks)

Question 62

A school snack bar offers a choice of four snacks.
The four snacks are burgers, pizza, pasta and salad.
Student can choose **one** of these four snacks.

The table shows the probability that a student will choose burger or pizza or salad.

Snack	burger	pizza	pasta	salad
Probability	0.35	0.15		0.2

One student is chosen at random from the students who use the snack bar.

Work out the probability that the student chose pasta.

.....
(2 marks)

Averages from Frequency Tables

Question 63

Marie works for an optician.

She records the depth of a lens in each of the 100 pairs of glasses on display.

In which group does the median lie?

$10 \leq x < 20$

$20 \leq x < 30$

$30 \leq x < 40$

$40 \leq x < 50$

.....
(1 mark)

Question 64

Hardeep asks 25 people how many portions of fruit and vegetables they ate yesterday.

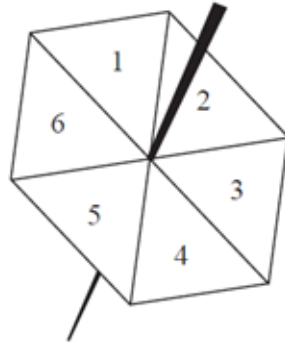
The results are shown in this table.

Number of portions	Frequency	
4	4	
5	6	
6	8	
7	5	
8	2	

Calculate the mean number of portions.

.....
(3 marks)

Question 65



Becky has a biased 6-sided spinner.
She spins the spinner 25 times.
She records the score for each spin.
The table shows information about her scores.

Score	Score Frequency
1	9
2	6
3	3
4	2
5	1
6	4

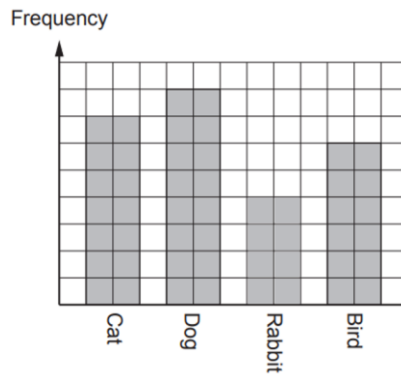
Work out her mean score.

.....
(3 marks)

Bar charts

Question 66

The bar chart below shows some information about the number of petes seen by a vet on Tuesday.



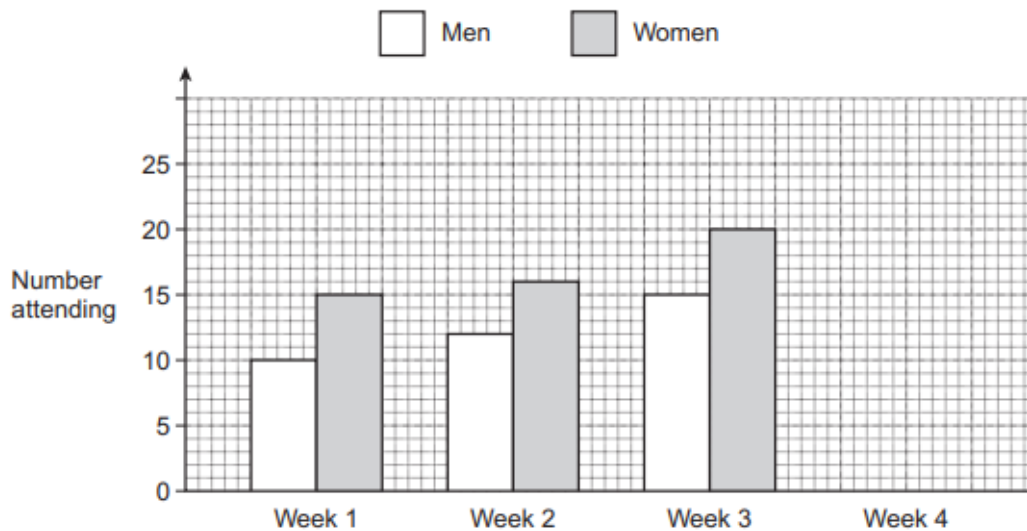
Which is the modal type of pet?

(1 mark)

Question 67

Alison records how many men and women attend her fitness class over four weeks.

The bar chart shows the information for Weeks 1, 2 and 3.



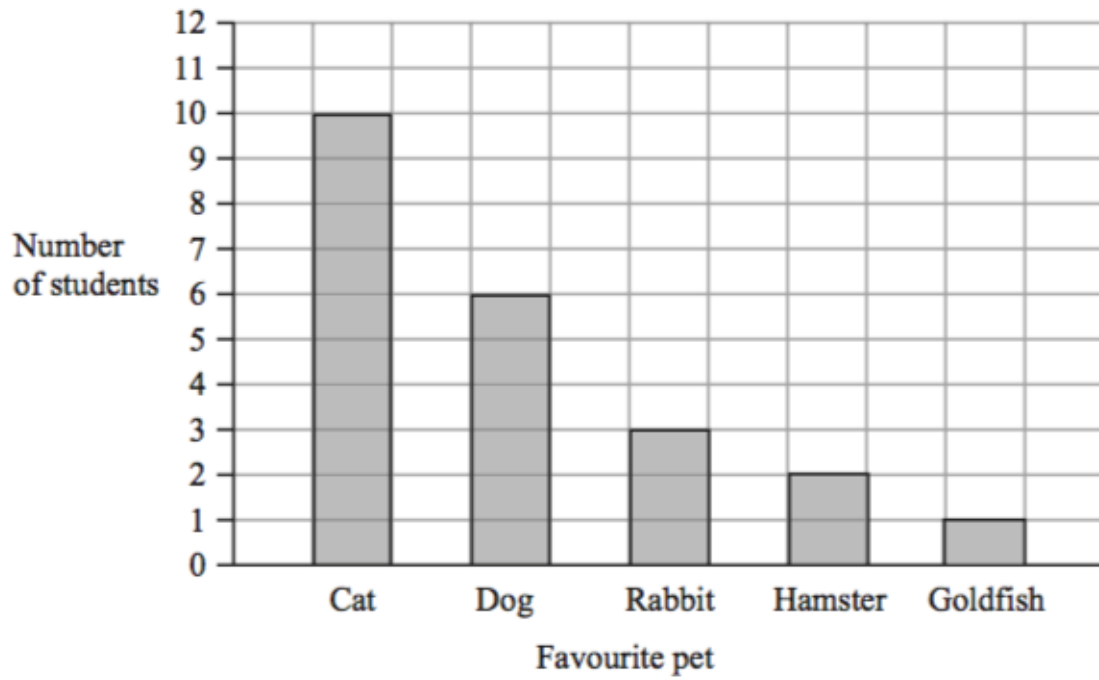
How many people attended in Week 3 altogether?

..... people

(1 mark)

Question 68

Jessica asked some students to tell her their favourite pet. She used the information to draw this bar chart.



Work out the number of students that Jessica asked.

..... students

(1 mark)

Pie Charts

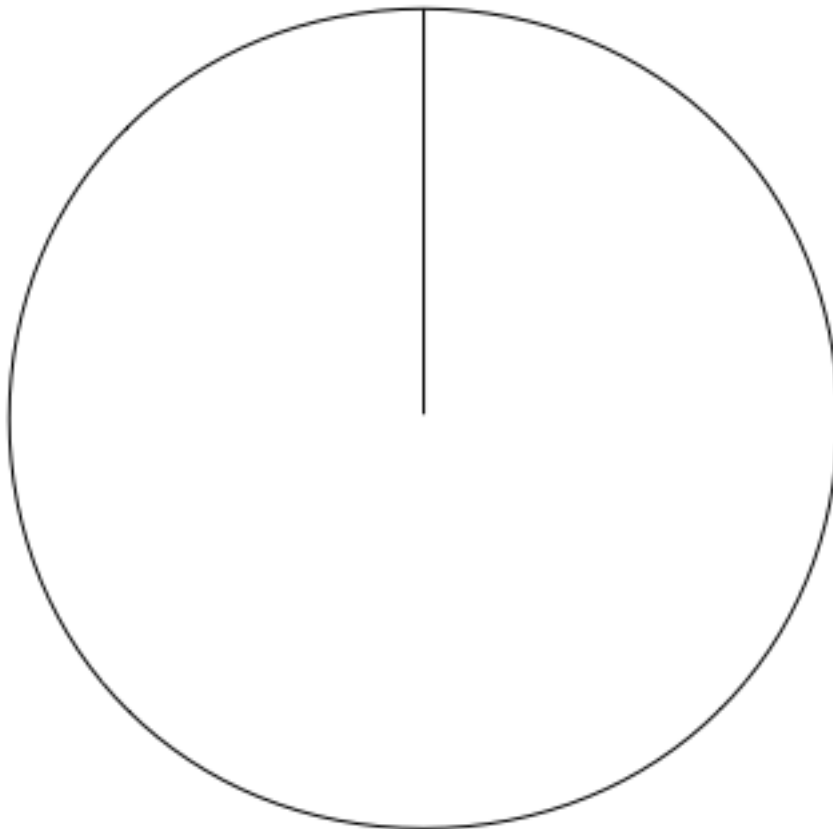
The table shows some information about the colours of cars parked in a car park.

Colour	Frequency
Black	24
Silver	16
White	15
Blue	5

- (a) What fraction of cars are white?
Give your answer in its simplest form.

- (b) Draw an accurate pie chart to show this information.

.....
(2)

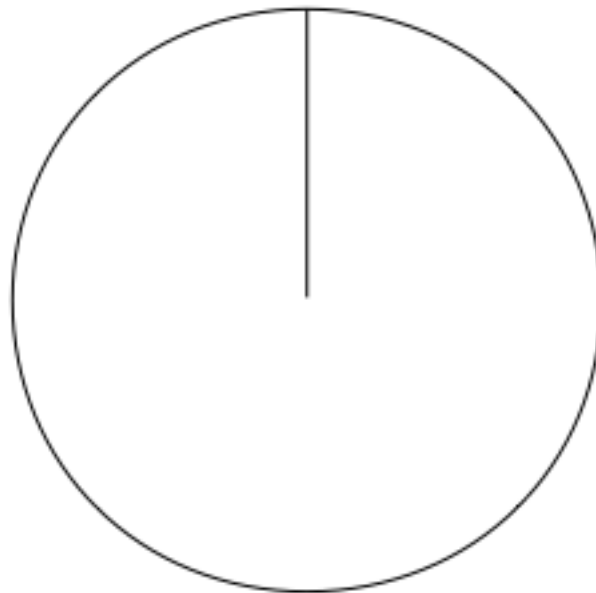


(4)

The table gives information about the languages studied by year 11 students at school A.

Language	French	German	Spanish
Number of Students	58	33	29

(a) Draw an accurate pie chart for this information



(4)

The pie chart below shows information about the languages studied by year 11 students at school B.



Maggie says: "the pie charts show that more year 11 students at school B study French"

(b) Is Maggie right?
You must explain your answer

.....
.....

(1)