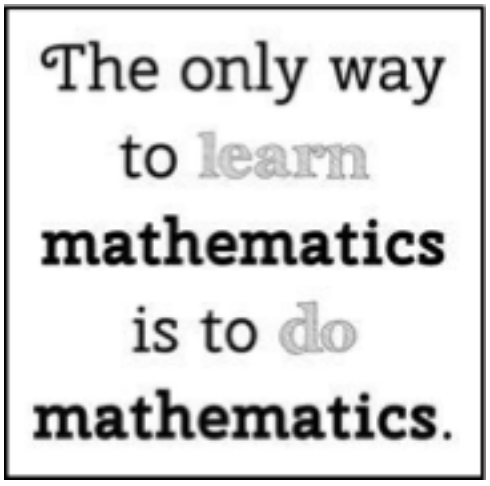
Yr11 Preparations

Effort		
R	A	G

GCSE Maths



Non-Calculator Practice Booklet (F)

Name: _____

Paper 1 – Non Calculator

Week	Topics	R	A	G
Number				
1	Addition & Subtractions			
	Multiplication & Division			
	Order of Operations			
	Primes, Factors, Multiples			
	HCF & LCM			
	Squares and Cubes			
	Fractions			
	Fractions, Decimals & Percentages			
Algebra				
2	Collect Like Terms			
	Expanding & Factorising			
	Solving Linear Equations			
	Equations of Straight Lines (Y=MX+C)			
	Quadratic Graphs			
Ratio & Proportion				
3	Ratio Problem Solving			
	Share in a Given Ratio			
	Recipe Problems			
	Speed, Distance Time			
Geometry				
4	Area & Perimeter			
	Angles on Parallel lines			
	Converting Measures			
	Plans & Elevations			
	Transformations			
Statistics & Probability				
5	Mutually Exclusive Events			
	Experimental Probability			
	Relative Frequency			
	Two Way Tables			

Topics - Clip Number

Number

Addition & Subtractions

Question 1

The table shows the temperature every four hours one day in December.

Time	Temperature
2 a.m.	6 °C
6 a.m.	–4 °C
10 a.m.	–2 °C
2 p.m.	8 °C
6 p.m.	5 °C
10 p.m.	–1 °C

Work out the difference between the temperature at 2 p.m. and the temperature at 6 p.m.

..... $^{\circ}C$

(1 mark)

Question 2

Work out the following.

$$362 - 207$$

.....

(1 mark)

Question 3

The table below shows the prices of items in a shop.

Price List	
Eraser	58p
Revision guide	£3.45
Calculator	£7.25
Pen	35p
Geometry set	£0.95

Salma buys a pen, a geometry set and a calculator. She pays with a £10 note.
How much change should she get?

£ .....

(2 marks)

Multiplication & Division

Question 4

Work out

$$4 \times 7 \times 5$$

.....

(2 marks)

Question 5

Work out

$$285 \times 34$$

.....

(3 marks)

Question 6

Work out $\frac{522}{6}$

.....

Order of Operations

Question 7

Work out $3 \times 5 + 7$

.....

(1 mark)

Question 8

Work out.

$$5 \times (2 + 4)$$

.....

(1 mark)

Question 9

Work out.

$$(9 - 3 \times 2)^2$$

.....

(2 marks)

Primes, Factors, Multiples

Question 10

Select the factor of 40

[ ] 6

[ ] 12

[ ] 13

[ ] 16

[ ] 20

[ ] 27

(1 mark)

Question 11

Write down all the prime numbers between 15 and 30

.....

(2 marks)

Question 12

Write 168 as a product of its prime factors.

168 = ...

(2 marks)

HCF & LCM

Question 13

Find the Highest Common Factor (HCF) of 54 and 90.

.....

(2 marks)

Question 14

Find the lowest common multiple (LCM) of 18 and 63.

.....

(2 marks)

Question 15

The first buses to X and Y leave a bus station at 7 am

Buses to X leave every 25 minutes.
Buses to Y leave every 20 minutes.

When will the buses to X and Y next leave at the same time?

..... : .....

(3 marks)

Squares and Cubes

Question 16

Write down the smallest even cube number.

.....

(1 mark)

Question 17

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

.....

(2 marks)

Fractions

Question 19

Write $\frac{32}{9}$ as a mixed number.

.....

(1 mark)

Question 20

Work out

$$\frac{7}{8} - \frac{1}{6}$$

Give your answer in its simplest form.

.....

(2 marks)

Question 21

A full glass of water holds $\frac{1}{6}$ of a bottle of water.

How many glasses of water can be filled from $2\frac{1}{2}$ bottles of water?

.....

(3 marks)

Fractions, Decimals & Percentages

Question 22

Write 0.36 as a percentage.

..... %

(1 mark)

Question 23

Write down the number that is halfway between $\frac{4}{5}$ and 1.4

.....

(2 marks)

Question 24

Huw is paid a weekly wage. Every week he:

saves $\frac{1}{5}$ of his wage,

spends 70% of the money he has left on his living expenses,

spends all that remains on his social life.

One week, Huw saves £40.
How much does Huw spend on his social life?

£ .....

(3 marks)

Algebra

Collect Like Terms

Question 25

Simplify fully

$$3 \times m \times 2 \times p$$

.....

(1 mark)

Question 26

Simplify

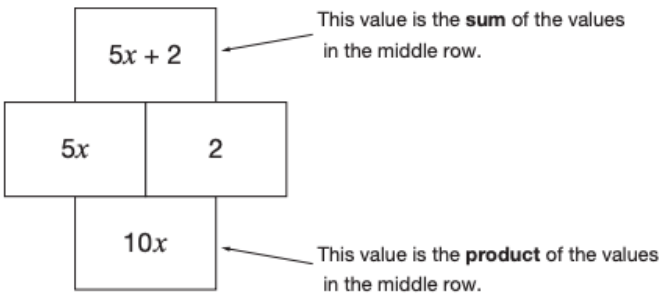
2a - b + 5a - 3b,

.....

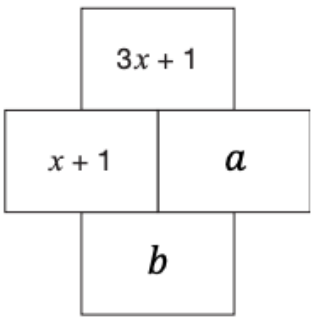
(2 marks)

Question 27

Here are the rules for an algebra grid.



Use these rules to complete the algebra grids below.
Write your expressions as simply as possible.



Question 28

Multiply out.

$$4c(d-5)$$

.....

(2 marks)

Question 29

Expand and simplify

$$5(4x+3)-(3x-1)$$

.....

(2 marks)

Question 30

Expand and simplify

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

.....

(2 marks)

Question 31

Factorise

$$7x - 21$$

.....

(1 mark)

Question 32

Factorise fully

$$4y^2 + 6y$$

.....

(2 marks)

Solving Linear Equations

Question 33

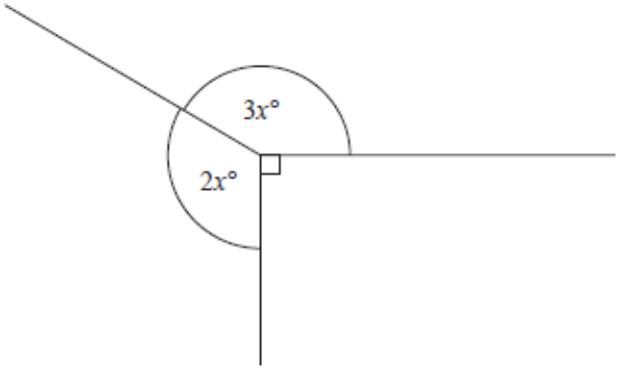
Solve.

$$7d + 16 = 51$$

.....

(2 marks)

Question 34



Find the value of x.

$x =$ ..... °

(3 marks)

Question 35

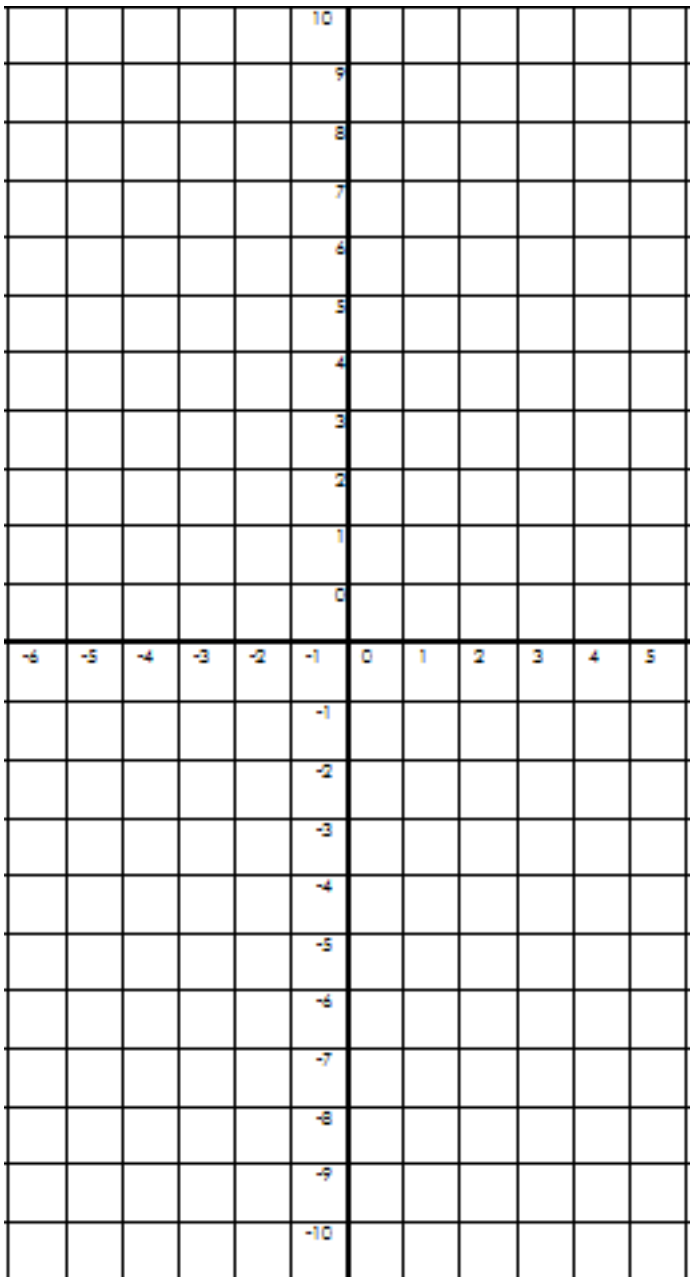
Solve $5x - 1 = 3x + 4$.

.....

(2 marks)

Question 36

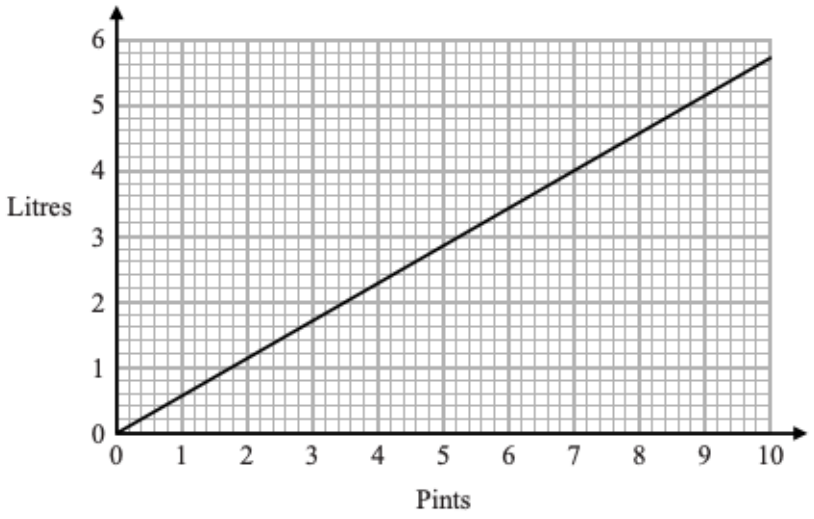
On the grid, draw the graph of $y = 3x - 4$ for values of x from −2 to 3.



(4 marks)

Question 37

You can use this graph to change between pints and litres.



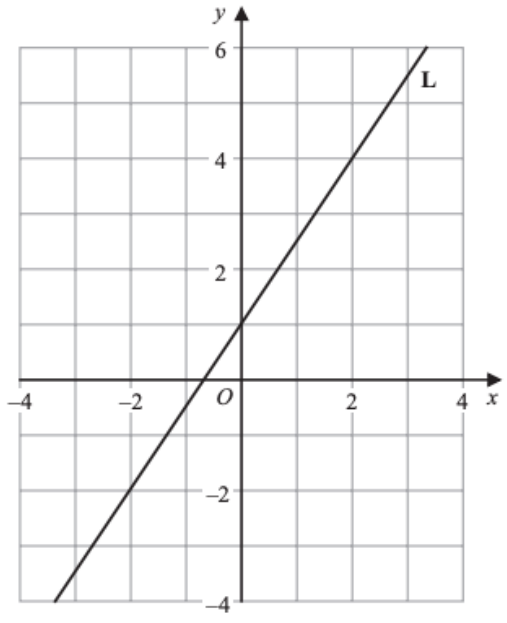
Work out the gradient of the line.

.....

(2 marks)

Question 38

The line L is drawn on the grid.



Find an equation for L.

.....

(3 marks)

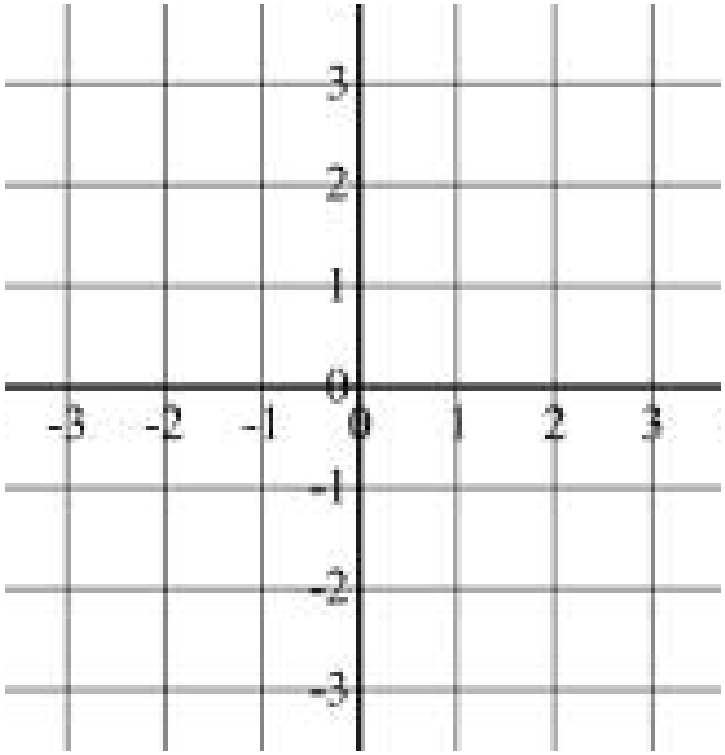
Question 39 & 40

Complete the table

x	-2	-1	-0.5	0	1
$y = x^2 + x - 1$	.....	-1	-1.25	.....	.....

(2 marks)

Using the table, plot the graph of $y = x^2 + x - 1$



(2 marks)

Question 41

The ratio 20 minutes to 1 hour can be written in the form 1 : n.

Find the value of n.

.....

(1 mark)

Question 42

Gavin, Harry and Isabel each earn the same monthly salary.

Each month,

Gavin **saves** 28% of his salary and spends the rest of his salary
Harry spends $\frac{3}{4}$ of his salary and **saves** the rest of his salary the amount of salary

Isabel saves : the amount of salary she spends = 3 : 7

Work out who saves the most of their salary each month.

[ ] Gavin

[ ] Harry

[ ] Isabel

(4 marks)

Question 43

Kiaria is 7 years older than Jay.
Martha is twice as old as Kiaria.
The sum of their three ages is 77.

Find the ratio of Jay's age to Kiaria's age to Martha's age.

..... : ..... : .....

(4 marks)

Share in a Given Ratio

Question 44

The Sharks club has two types of membership: swimmers or divers.
The ratio of swimmers to divers is $8:3$.
18 members of the club are divers.

How many members does *The Sharks* club have?

..... members

(2 marks)

Question 45

All the teachers at a school are either left footed or right footed.
At the school

the number of left footed teachers : the number of right footed teachers $= 3: 13$

At the school, there are 18 left footed teachers.

How many right footed teachers are there?

..... right footed teachers

(2 marks)

Question 46

Talil is going to make some concrete mix.
He needs to mix cement, sand and gravel in the ratio 1 : 3 : 5 by weight.

Talil wants to make 180 kg of concrete mix.

Talil has

15 kg of cement
85 kg of sand
100 kg of gravel

Does Talil have enough cement, sand and gravel to make the concrete mix?

Input note: write down how much Talil would need.

..... kg of cement

..... kg of sand

..... kg of gravel

(4 marks)

Question 48

Here is a list of ingredients for making 16 flapjacks.

Ingredients for 16 flapjacks

120 g butter
140 g brown sugar
250 g oats
2 tablespoons syrup

Jenny wants to make 24 flapjacks.

Work out how much of each of the ingredients she needs.

butter: ..... g

brown sugar: ..... g

oats ..... g

syrup ..... tablespoons

(3 marks)

Question 49

Here is a list of the ingredients needed to make leek and potato soup for 6 people.

Leek and Potato Soup	
Ingredients for 6 people	
900 ml	chicken stock
900 ml	water
750 g	leeks
350 g	potatoes
350 g	onions

Mary makes leek and potato soup for a group of people.
She uses 3 kg of leeks.

Work out the number of people in the group.

..... people

(2 marks)

Question 50

A train travelled from Dhaka to Darshana.

The train took 5 hours and 30 minutes.
The train travelled a distance of 327 kilometres.

Work out the average speed of the train.

Give your answer in kilometres per hour correct to the nearest whole number.

..... km/h

(3 marks)

Question 51

Three electric cars are tested by driving them around a track until the battery runs out.
The table shows some information about their performance.

Complete the table.

Car	Total time travelled (hours)	Average speed (km/h)	Total distance travelled (km)
A	4	35	.....
B	.....	40	180
C	3	.....	150

(3 marks)

Question 52

On Monday, Tarek travelled by train from Manchester to London.

Tarek's train left Manchester at 08 35
It got to London at 11 05
The train travelled at an average speed of 110 miles per hour.

On Wednesday, Gill travelled by train from Manchester to London.

Gill's train also left at 08 35 but was diverted.
The train had to travel an extra 37 miles.
The train got to London at 11 35

Work out the difference between the average speed of Tarek's train and the average speed of Gill's train.

..... mph

(4 marks)

Geometry

Area & Perimeter

Question 53

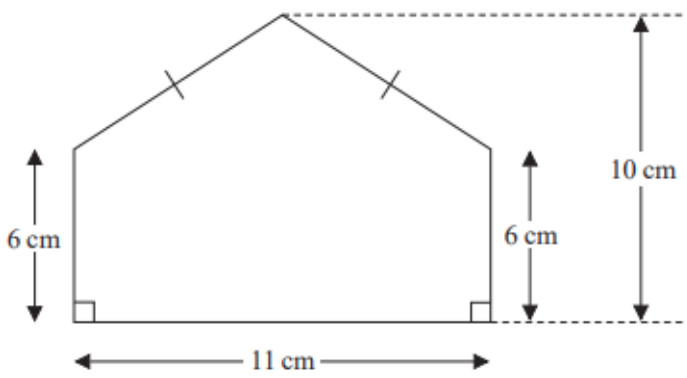


Diagram **NOT** accurately drawn

Work out the area of the shape.

..... cm^2

(2 marks)

Question 54

Michael is going to put solar panels on a part of the roof.
This part of the roof is a rectangle, $ABCD$, 10 m by 8 m.
Michael arranges the solar panels in the shape of a rectangle, 8 m by 6 m.

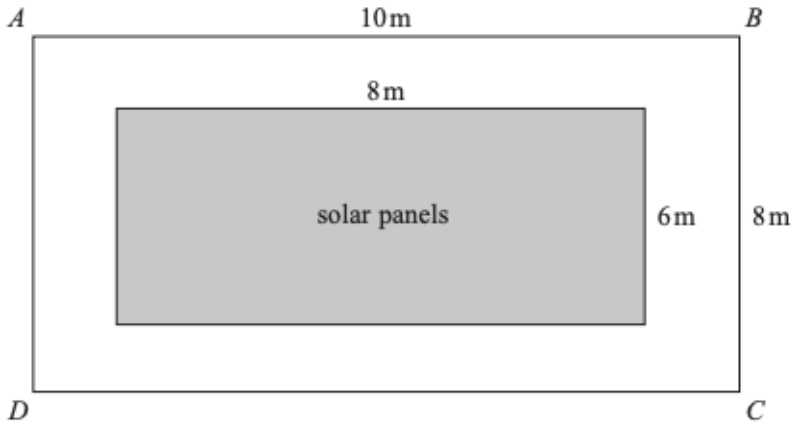


Diagram **NOT** accurately drawn

Is the area of the rectangle of solar panels more than 75% of the area of the rectangle $ABCD$?

[ ] Yes

[ ] No

(3 marks)

Question 55

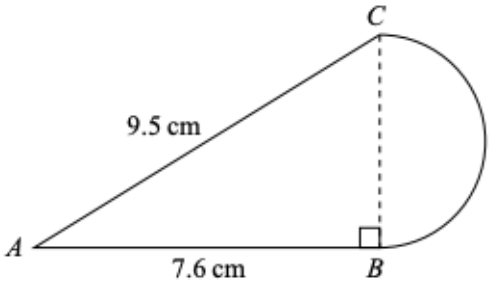


Diagram **NOT** accurately drawn

The diagram shows a shape made from triangle ABC and a semicircle with diameter BC.
Triangle ABC is right-angled at B.

$AB = 7.6$ cm and $AC = 9.5$ cm.

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

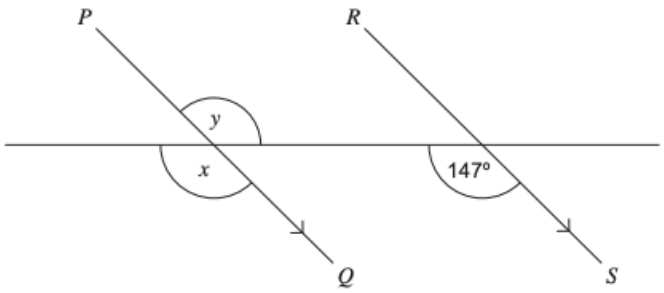
..... cm ^{2}

(5 marks)

Angles on Parallel lines

Question 56

PQ and RS are parallel.



Not drawn accurately

Write down the value of x.

Give a reason for your answer.

$x =$ ..... °

because .....

Question 57

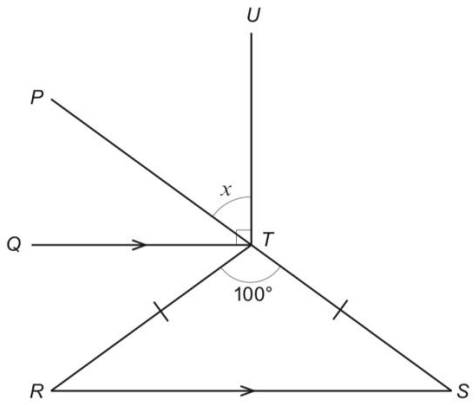


Diagram not drawn to scale

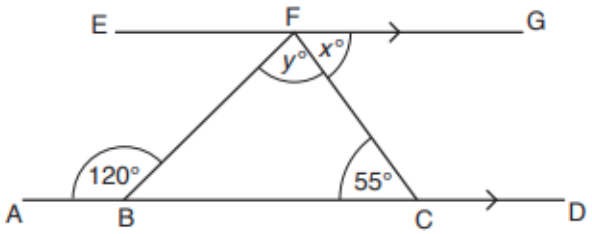
Find the angle x.

..... °

(4 marks)

Question 58

In the diagram, $ABCD$ is parallel to EFG.
Angle $BCF = 55°$ and angle $ABF = 120°$.



Not to scale

Work out y.

$y =$ ..... °

(2 marks)

Converting Measures

Question 59

Change 8 litres into millilitres.

..... ml

(1 mark)

Question 60

Memona has a 6 kg sack of rice and some empty bags.
She fills each bag with 475 grams of rice from the sack.

How many bags can Memona completely fill with rice?

..... bags

(3 marks)

Question 61

Here is a tile in the shape of a polygon.

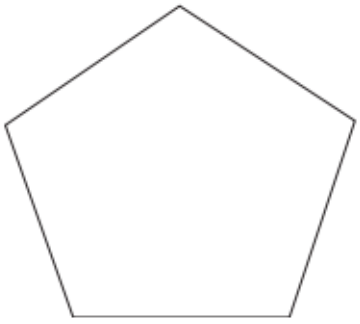


Diagram **NOT** accurately drawn

The area of the tile is 8560 mm ^{2}

Change 8560 mm ^{2} to cm ^{2}.

..... cm ^{2}

(2 marks)

Question 62

The diagram shows a cylinder.

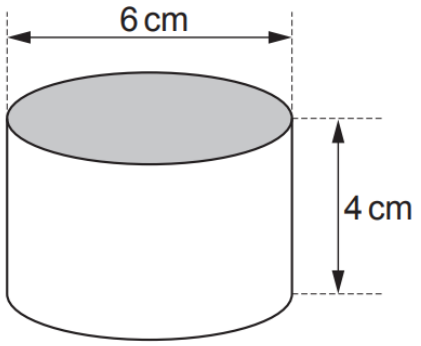


Diagram not drawn to scale

Describe what you would draw for the plan and side elevation of the cylinder

Plan: .....

Side elevation: .....

(2 marks)

Question 63

Halima makes a shape by joining 5 cubes.

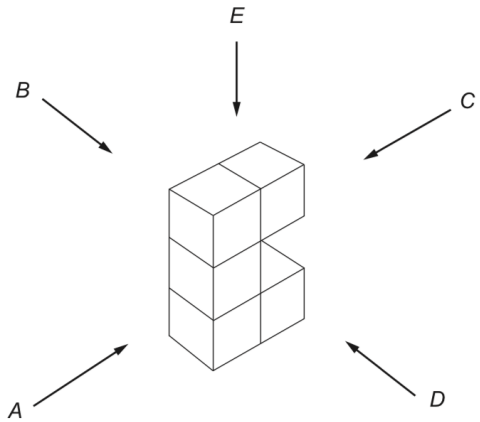


Diagram not drawn to scale

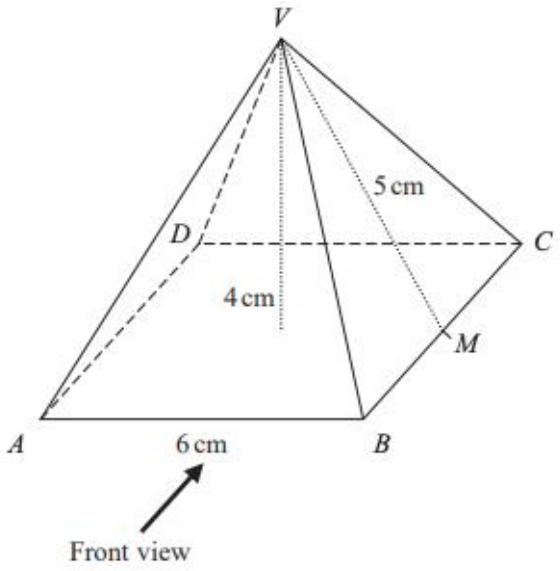
How many square faces can Halima see from position C?

.....

(1 mark)

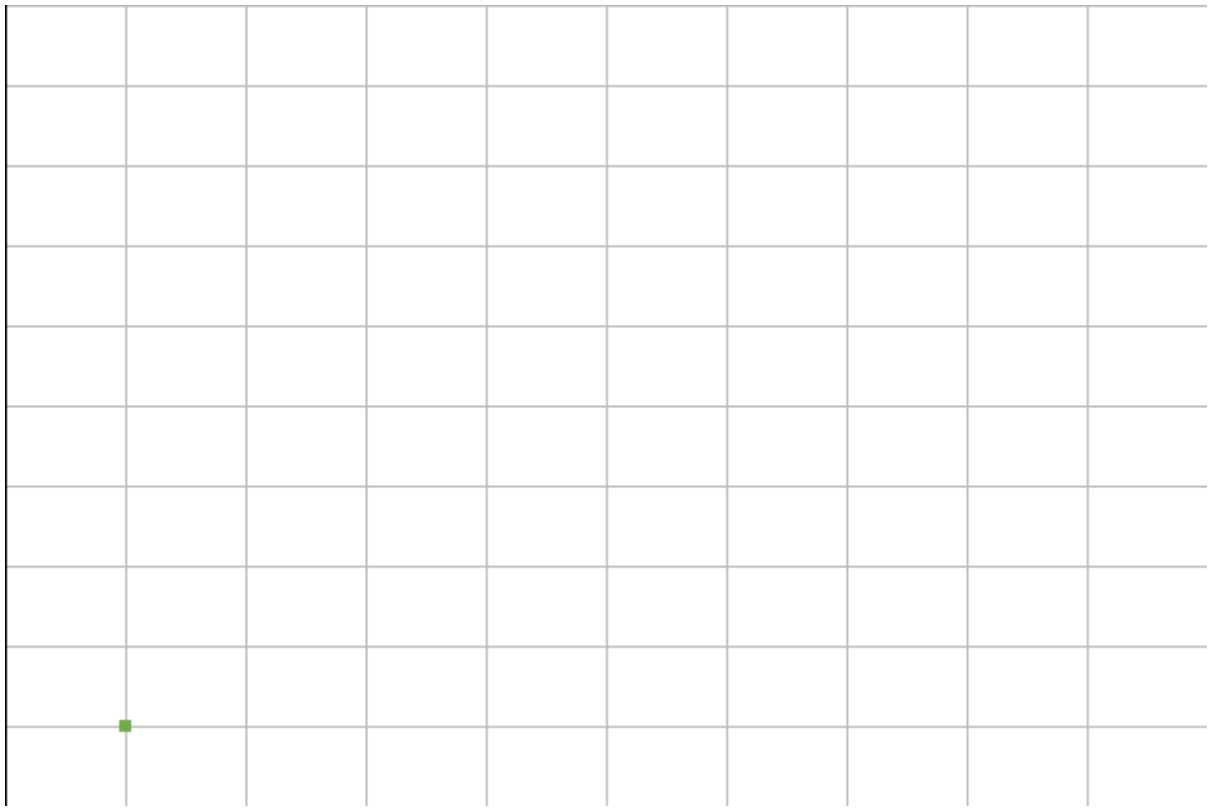
Question 64

Here is a solid square-based pyramid, $VABCD$.



The base of the pyramid is a square of side 6 cm.
The height of the pyramid is 4 cm.M is the midpoint of BC and $VM = 5$ cm

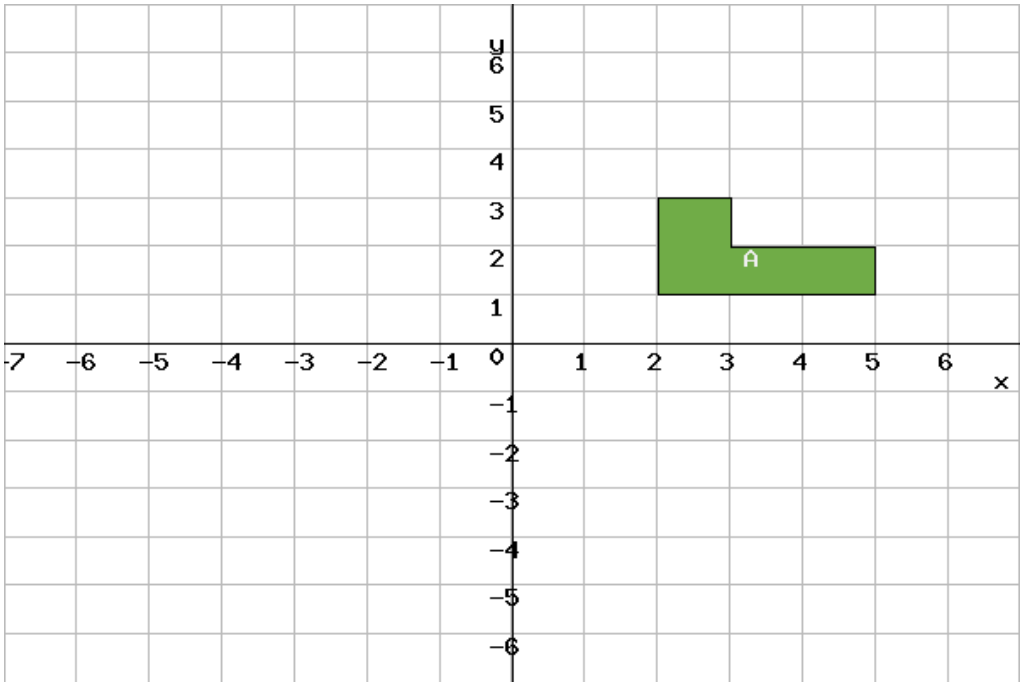
Draw an accurate front elevation of the pyramid from the direction of the arrow, with the left corner starting on the dot.



(2 marks)

Question 65

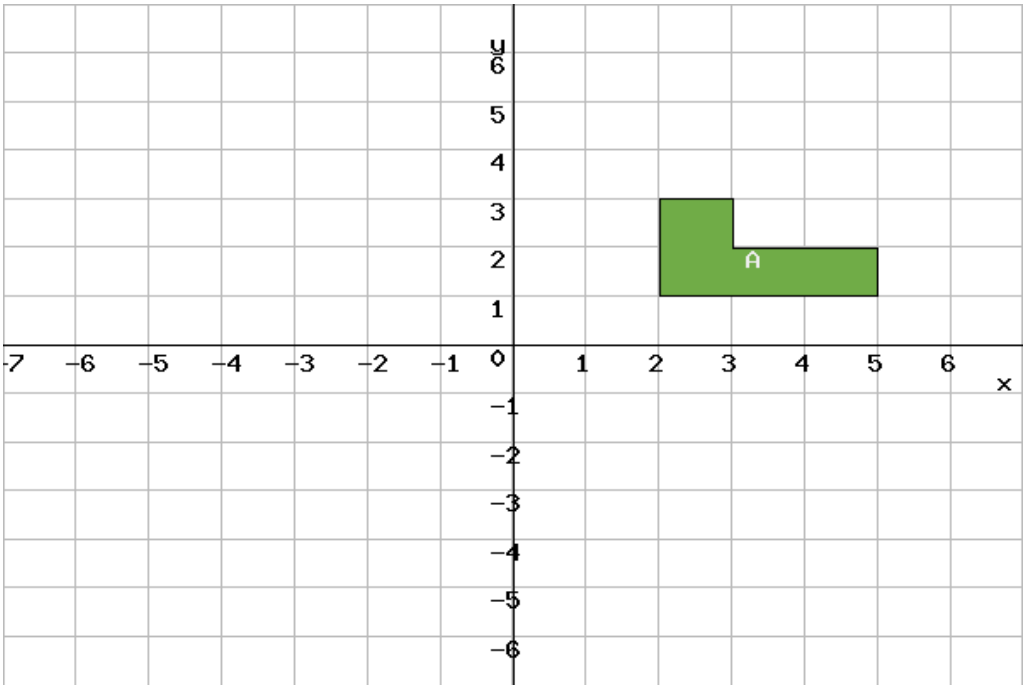
Translate shape A by the vector $\begin{pmatrix} -4 \\ -6 \end{pmatrix}$



(1 mark)

Question 66

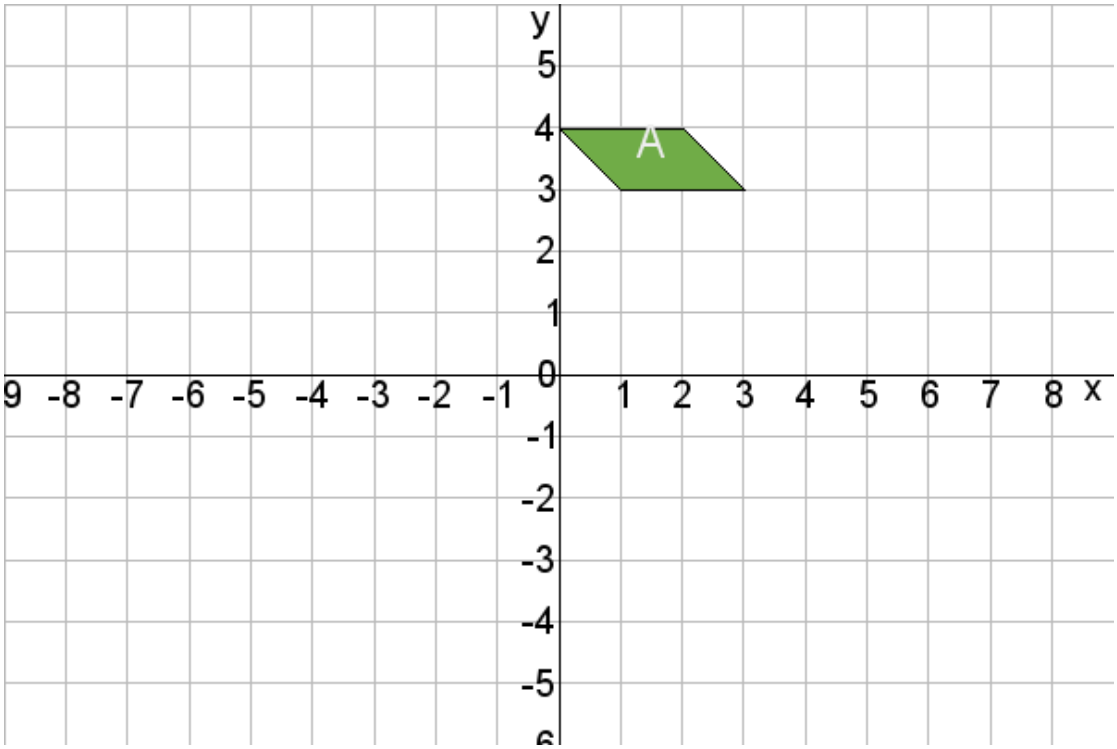
Draw the reflection of the shape in the line $y = -1$



(2 marks)

Question 67

On the grid below, rotate shape **A** 90° anticlockwise with centre $(0,1)$

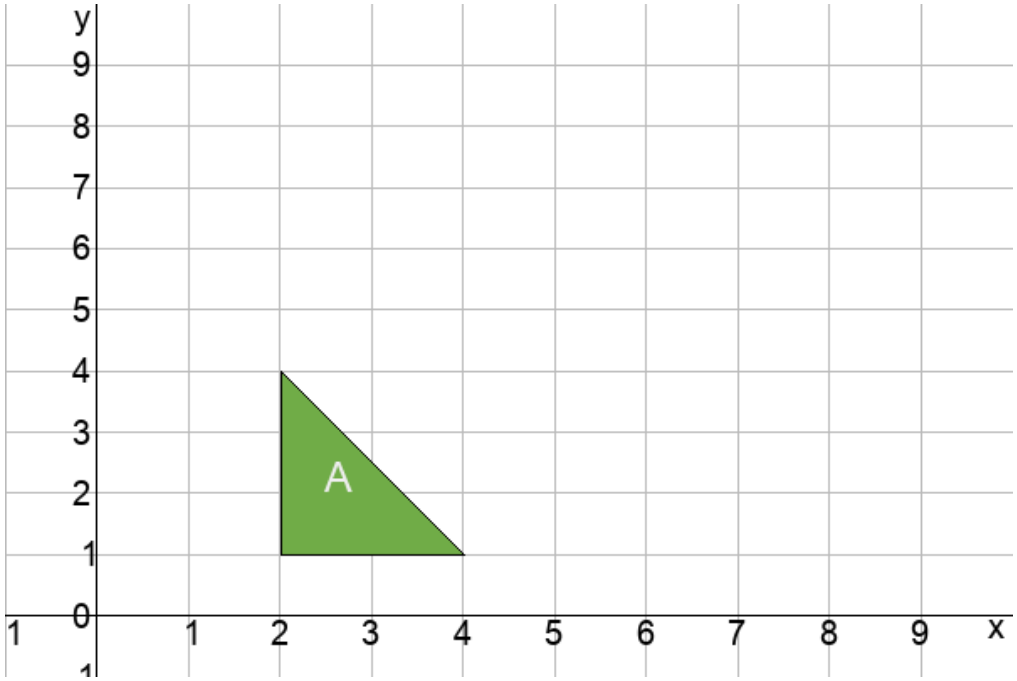


(2 marks)

Question 68

Triangle A is drawn on the grid below.

Enlarge triangle A with scale factor 2 and centre of enlargement $(0,0)$.



(3 marks)

Question 70

There are 10 balls in a bag.
They are red or blue or yellow.

There are twice as many blue balls as red balls.
There are more red balls than yellow balls.

A ball is taken at random from the bag.

Fill in the table to show the probability of taking each colour.

Colour	Red	Blue	Yellow
Probability	.....	.....	.....

(3 marks)

Question 71

Leo has a bag containing red, yellow, blue and green counters.
Leo thinks he knows the probability of choosing a counter of each colour from the bag without looking.
He writes the probabilities in this table.

Red	Yellow	Blue	Green
$\frac{1}{12}$	$\frac{1}{4}$	$\frac{1}{3}$	$\frac{5}{12}$

Explain how you know Leo must have made a mistake in his table.

.....

(5 marks)

Experimental Probability

Relative Frequency

Question 73

A fishing lake contains thousands of fish.
The fish are Carp, Bream or Roach.

10 fish are caught.
The table shows some of the results.

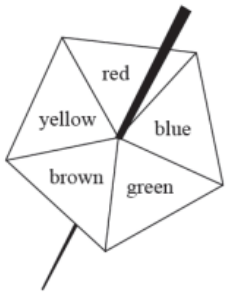
Complete the table.

	Carp	Bream	Roach
Frequency	4	.....	.....
Relative frequency	.....	0.1	.....

(3 marks)

Question 74

Here is a biased 5-sided spinner.



Kenny spins the spinner once.
The table gives the probabilities that the spinner lands on red or on blue or on green.

Colour	red	blue	green	brown	yellow
Probability	0.15	0.26	0.33		

When the spinner is spun once, the probability that the spinner lands on brown is 0.06 more than the probability that the spinner lands on yellow.

Jenine spins the spinner 150 times.

Work out an estimate for the number of times the spinner lands on yellow.

..... times

(4 marks)

Question 75

Cherie is in charge of marketing for a tourist attraction.

Cherie records the number of visitors to the tourist attraction each season for 4 years.

Her results are shown in the table.

	Season	Winter	Spring	Summer	Autumn
Visitors (thousands)	2015	9	14	19	13
	2016	9	13	17	12
	2017	6	11	14	9
	2018	4	8	15	10

[ ] The annual number of visitors are going up.

[ ] More people visit in the Summer compared to any other season

[ ] The annual number of visitors seems to be decreasing

[ ] The colder the weather the less visitors come to the tourist attraction

(1 mark)

Question 76

80 students studying sciences were asked which science subject they liked the best.
Some information about the results is shown in the two-way table.

Complete the two-way table.

	Biology	Chemistry	Physics	Total
Boys	25	.....	7	.....
Girls	.....	4	.....	43
Total	31	.....	.....	80

(3 marks)

Question 77

There are 45 swimmers in the *Top Swim* club.

All swimmers are learning butterfly and backstroke and are asked which they prefer.

$\frac{3}{5}$ of all swimmers prefer backstroke.

The number of juniors is double the number of seniors in the club.

$\frac{1}{6}$ of the juniors prefer butterfly.

Work out the proportion of swimmers who are seniors and prefer backstroke.
You may use the table to help you.

	Prefer to swim		
	Butterfly	Backstroke	Total
Seniors			
Juniors			
Total			45

.....

(5 marks)