NAME

Non-calculator

1 A new path is 7.9 m long and 0.95 m wide.

Jason wants to cover the path with pebbles.

The pebbles for the path cost £28.95 per m^2.

a Estimate the cost of the pebbles.

£.....

(2 marks)

b Will your estimate be more or less than the actual cost of the pebbles?

Explain why.

.....

.....

(1 mark)

2 Work out $[6 + 12 \div (10 - 4)]^2$

.....

(2 marks)

3 Estimate the answer to this calculation.

$$\frac{\sqrt{2.3 \times 8.12}}{1.8^2}$$

.....

(2 marks)

4 Write 27^6 as a single power of 3

.....

(2 marks)

5 What is the missing power in this calculation?

$2^6 \div 2 \quad \times 2 = 2^3$

.....

(1 mark)

6 In computing, a kilobyte is 2^{10} bytes, a megabyte is 2^{20} bytes.

How many times bigger is a megabyte than a kilobyte?

.....

(2 marks)

7 Evaluate $\left(\frac{2^3}{3^2}\right)^2$

.....

(2 marks)

8 Work out $\frac{(4 \times 5)^2}{15 \times 4^3}$

Give your answer as a fraction in its simplest form.

.....

(3 marks)

9 A 1p coin weighs 3.56 g.

Work out the weight of one million 1p coins.

Give your answer in kg in standard form.

..... kg

(2 marks)

Calculator

10 Show that these calculations give the same answer.

$[(4 - 5) \times 3]^2$ $(4 - 5)^2 \times 3^2$

(2 marks)

11 Carol squares a positive fraction with denominator 10

Her answer is 0.09

What fraction did Carol square?

.....

(2 marks)

12 Use your calculator to work out 59 250 000 × 23 400

Give your answer in standard form to 3 s.f.

.....

(1 mark)

13 The table shows the approximate populations of four of the world's continents.

Write the continents in order of size from smallest to largest.

Continent	Population
Europe	7.4×10^8
Africa	1.2×10^9
Asia	4.58×10^9
North America	5.79×10^8

.....

(2 marks)

14 Work out $(20 \times 5)^{-2}$

Give your answer as a decimal.

.....

(2 marks)

15 There are 1 000 000 nanometres in a millimetre.

Molecules of water can be modelled as spheres with diameter 0.275 nanometres.

What is this measurement in millimetres?

Write your answer in standard form.

.....

(2 marks)

Overall mark	**/30**

NAME

Non-calculator

1 Solve $\frac{5x}{4} = -10$

.....

(1 mark)

2 Solve $3p + 1 = 2p - 7$

.....

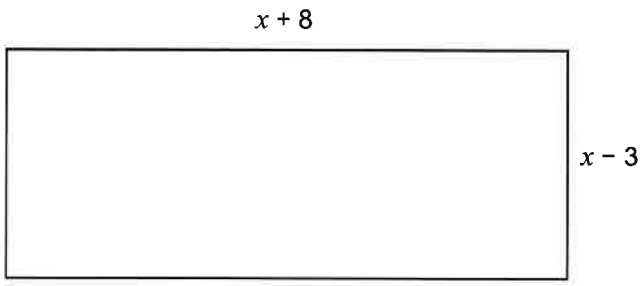
(2 marks)

3 Work out the value of $2t^3 - t$ when $t = 2$

.....

(2 marks)

4 Write and simplify an expression for the area of the rectangle.



.....

(2 marks)

5 Simplify $\frac{6p^2 \times 4p^5}{8p^4}$

.....

(2 marks)

6 Solve $5(x + 7) = 3(x + 15)$

$x =$.....

(2 marks)

7 Work out the value of $\frac{(x-a)^2}{2a}$ when $x = -4$ and $a = 8$

.....

(2 marks)

8 Write $3z^2 \div 6z^3$ as a unit fraction

.....

(1 mark)

9 a Explain why it is not possible to work out the value of

$\sqrt{x^2 - y}$ when $x = -3$ and $y = 17$

.....

.....

(1 mark)

b Explain why it is possible to work out the value of

$\sqrt[3]{x^2 - y}$ when $x = -3$ and $y = 17$

.....

.....

(1 mark)

10 Simplify $x(x + 7) - (x + 3)(x - 1)$

.....

(2 marks)

Calculator

11 Cupcakes cost 60p each.

Boxes cost 40p each.

The cost of n cupcakes and two boxes is £7.40

Find the value of n.

.....

(2 marks)

12 To repair a computer, an IT expert charges £35 basic fee and then £1.40 per minute.

The total charge is £R for a repair taking x minutes.

a Write a formula for R in terms of x.

.....

(1 mark)

b Work out the cost of a repair that takes 45 minutes.

£.....

(2 marks)

13 Use the formu a $F = ma$ to calculate F when $m = 24$ and $a = 9.8$

£.....

(1 mark)

14 Use the formula $v^2 - u^2 = 2as$ to work out the value of a when

$v = 13$, $u = 2$, $s = 100$

.....

(2 marks)

15 Work out the value of $\sqrt{a^3 + 4b^2}$ when $a = 4$ and $b = 3$

.....

(2 marks)

16 $T = 7a^2 - a$

Work out the value of T when $a = -3$

.....

(2 marks)

Overall mark	**/30**

NAME

Non-calculator

1 Sixteen children in Class A sat a maths test. Here are their results.

32	24	9	16	24	18	7	30
9	22	37	9	31	20	15	28

a Find the median.

.....

(1 marks)

b Find the range.

.....

(1 marks)

Twenty children in Class B sat the same maths test. Here are the mode, median and range for their results.

Mode	25
Median	26
Range	31

c Compare the results for the two classes.

.....

.....

.....

.....

(2 marks)

2 Leila measures the lengths of worms, in centimetres. Here are her results.

6.1	4.5	7.6	3.8	9.1	7.2	8.0
4.8	5.2	10.3	6.4	10.8	9.7	9.9

a Complete the grouped frequency table to record this data.

Length, (L cm)	Frequency
$3 \leq L < 5$	
$5 \leq L < 7$	
$7 \leq L < 9$	
$9 \leq L < 11$	

(2 marks)

b What is the modal class?

.....

(1 mark)

c Write down the class interval that has the median length.

.....

(1 mark)

3 A battery manufacturer wants to test their batteries.

They put a battery in a torch, switch on the torch, and see how long the battery lasts.

Explain why testing a 10% sample of their batteries would not be suitable.

.....

.....

(1 mark)

4 Malek wants to select a random sample of 6 students from his class.

Which of these will give a random sample?

A The first 6 students on the register

B The first 6 students to arrive one day

C The first 3 boys on the register and the last 3 girls on the register

D Each student puts their name in a box, and 6 are picked out.

Explain the reasons for your choice.

.....

.....

.....

.....

(2 marks)

5 Mark recorded the temperature each day for a week.

He calculated the mean temperature and found it was 21.6°C

Mark's thermometer was not working properly. All seven temperatures were 3° too high.

Write down the correct mean temperature.

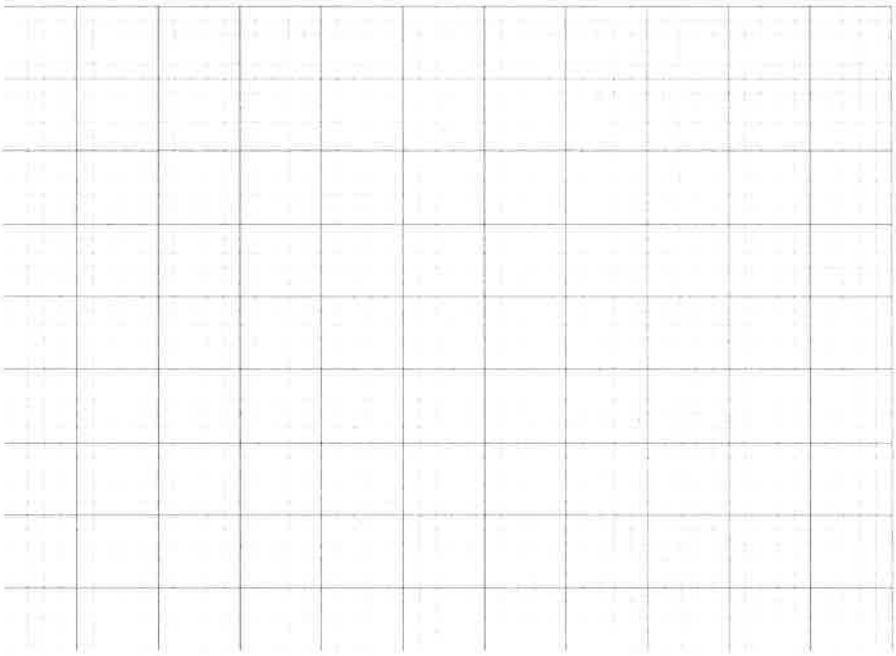
.....°C

(1 mark)

6 A swimming pool manager records the daily temperature and the number of swimmers in the pool each day.

Temperature (°C)	21	19	22	23	25	22	21	20	23	20
Number of swimmers	85	50	90	110	125	105	90	100	105	70

a Draw a suitable diagram to display the data.



(3 marks)

b The next day the temperature is expected to be 24°C.

How many swimmers should the manager expect to be in the pool?

.....

(2 marks)

c How reliable is your prediction in part **b**?

(1 mark)

Calculator

7 The table shows the weights of some chickens.

Weight, w kg	Frequency
$1.5 \leq w < 2$	7
$2 \leq w < 2.5$	12
$2.5 \leq w < 3$	6
$3 \leq w < 3.5$	14

a Work out an estimate for the mean weight. Give your answer to 2 s.f.

.....kg

(3 marks)

b Find the class that contains the median.

.....

(1 mark)

c Find the modal class.

.....

(1 mark)

8 A teacher records the marks scored by 30 students in an English test.

Mark	Frequency
1–5	1
6–10	4
11–15	6
16–20	6
21–25	8
26–30	5

a Calculate an estimate of the mean score.

Give your answer to 1 decimal place.

.....

(3 marks)

b The class also do a science test.

The modal class for the science test is 1–5

An estimate for the mean mark for the science test is 12.3

Compare the marks for English and science.

(2 marks)

A student is testing the hypothesis that students are better at English than science.

c Is the student's hypothesis correct?

Use the data from part **a** and **b** to explain.

(2 marks)

Overall mark	**/30**

NAME

Non-calculator

1 A garden centre pays £16 for each tree it buys.

The garden centre sells each tree for £20.

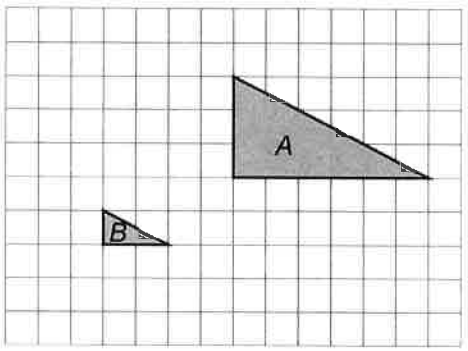
Work out the percentage profit for each tree.

£.....

(2 marks)

2 Linda says, 'Triangle *B* is an enlargement of triangle *A*.'

Tim says, 'You cannot have an enlargement that gives a smaller shape.'



a Explain why Tim is wrong.

.....

.....

(1 mark)

b What is the scale factor of the enlargement that maps triangle *A* onto triangle *B*?

.....

(1 mark)

3 Stan cycles 15 km to his grandmother's house.

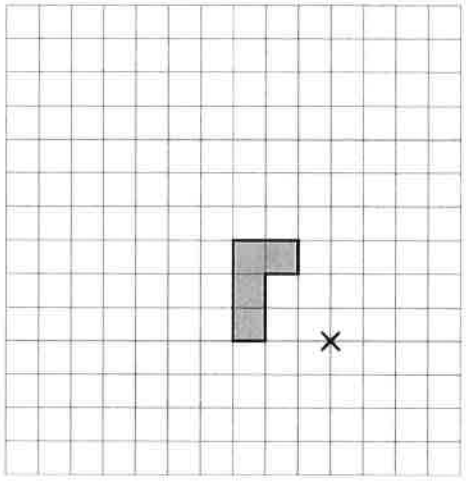
He cycles at an average speed of 20 km/h.

Work out the time, in minutes, that it takes Stan to cycle to his grandmother's house.

.....minutes

(2 marks)

4 Below is a shape and a centre of enlargement, ×.



On the grid, enlarge the shape:

a by scale factor 2, using the marked centre of enlargement

(2 marks)

b by scale factor −1, using the marked centre of enlargement.

(2 marks)

5 It takes 4 people working together 5 hours to put up a large tent.

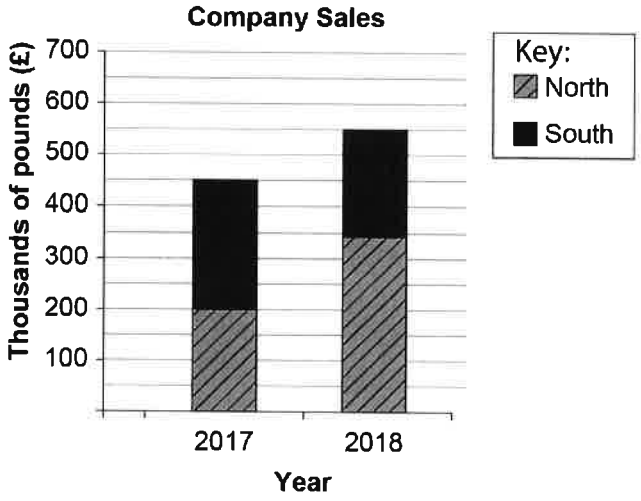
An event requires 3 large tents to be put up.

How long will it take 10 people working together to put up the 3 large tents?

.....

(2 marks)

6 The bar chart shows information about the sales of a company in thousands of pounds in 2017 and in 2018 for the North and South of the country.



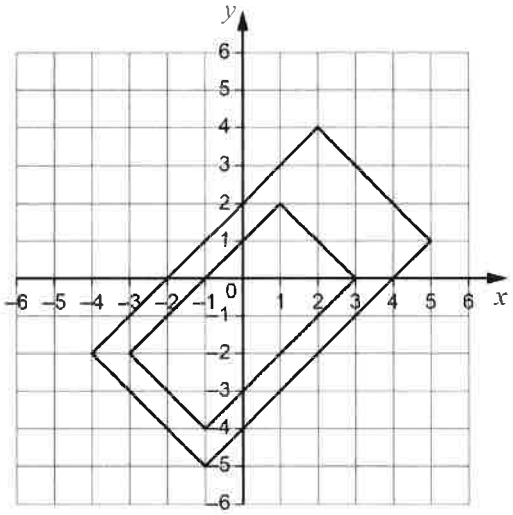
Work out the percentage decrease in sales in the South from 2017 to 2018.

Give your answer correct to one decimal place.

.....

(2 marks)

7 Describe fully the transformation that takes the small rectangle to the large rectangle.



.....

.....

.....

.....

.....

.....

(3 marks)

Calculator

8 The same coffee is sold in different bags, containing different weights, for different prices.

The table below gives the weights and prices of the three different sized bags of coffee.

Bag 1	Bag 2	Bag 3
400 g	650 g	270 g
£5	£6.50	£3

By working out the amount of coffee you get for £1, work out the bag that is best value for money.

.....

(3 marks)

9 A gold bar has a volume of 60 cm^3

Its mass is 1.158 kg

Calculate the density, in g/cm^3, of the gold bar.

..... g/cm^3

(2 marks)

10 There is a 30% reduction in prices during a sale.

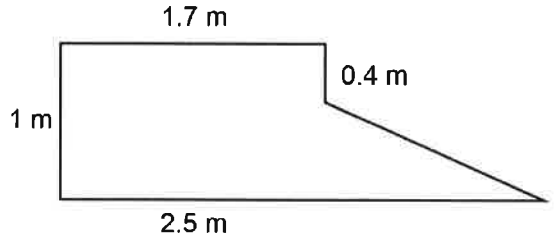
A bed is £245 in the sale.

What was the original price of the bed?

.....

(2 marks)

11 The diagram shows the dimensions of a metal plate.



A force of 344 N is applied to the metal plate.

Work out the pressure in N/cm^2.

Give your answer correct to 3 decimal places.

..... N/cm^2

(3 marks)

12 The number of cars crossing a bridge from 2016 to 2017 increased by 23%.

In 2018 the number of cars crossing the bridge decreased by 15%.

In 2018 the number of cars crossing the bridge was 888 675

Work out the number of cars that crossed the bridge in 2016.

.....cars

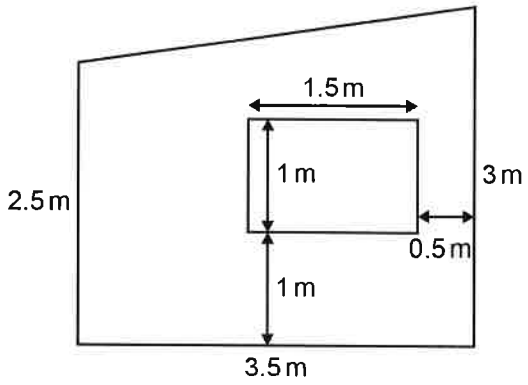
(3 marks)

Overall mark	**/30**

NAME

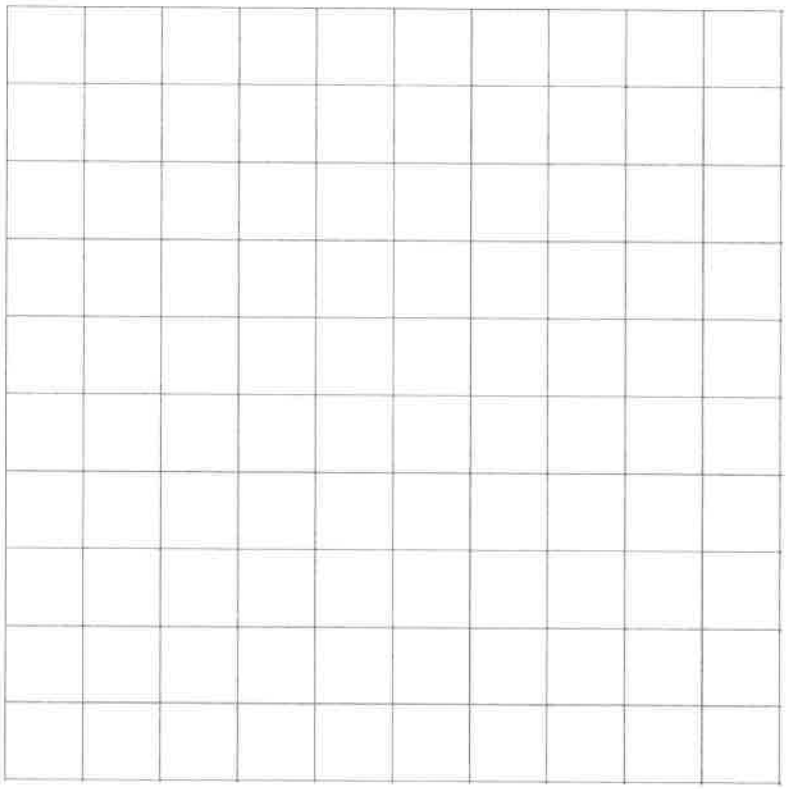
Non-calculator

1 The sketch shows the side view of a shed.



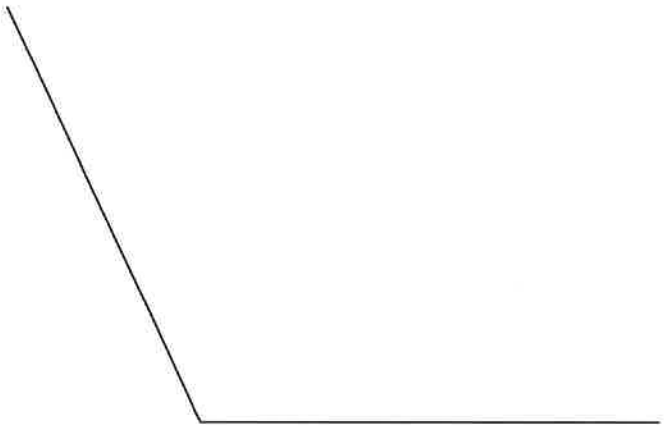
Draw an accurate scale diagram of this side view on the squared grid.

Use a scale of 1 square to 0.5 m.



(3 marks)

2 a Construct the angle bisector of this obtuse angle.



(2 marks)

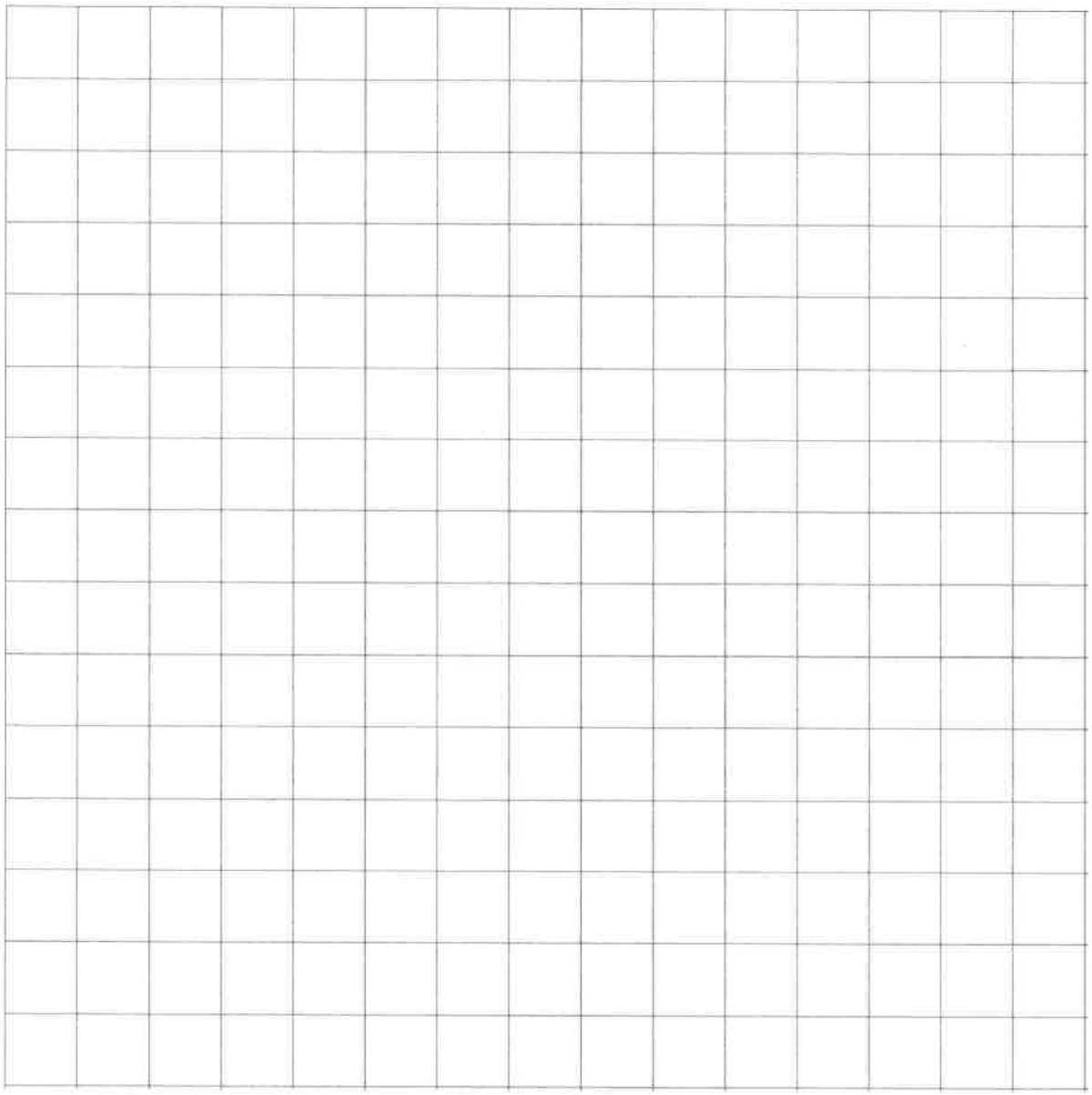
b Using your construction from part **a**, construct a rhombus with sides of 3 cm.

(2 marks)

3 A square-based pyramid has four triangular faces.

Each triangular face is an equilateral triangle of sides the length of 5 squares in the grid below.

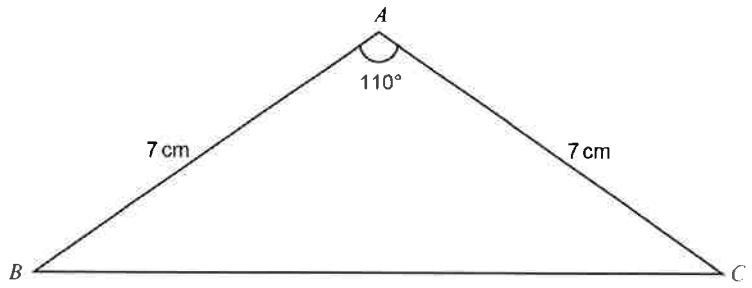
Draw an accurate net of the pyramid, using a ruler and compasses only to construct the triangles.



(2 marks)

4 Show that the perpendicular from A to the side BC is the angle bisector of angle A.

You must show all your construction lines.



(2 marks)

5 An upstairs window is 4.2 metres above the ground.

The wall is at right angles to the ground.

Suki wants to buy a ladder to reach the window.

For safety, the angle between the ground and the ladder **must be exactly** 75°.

a Work out the angle between the ladder and the wall.

.....°

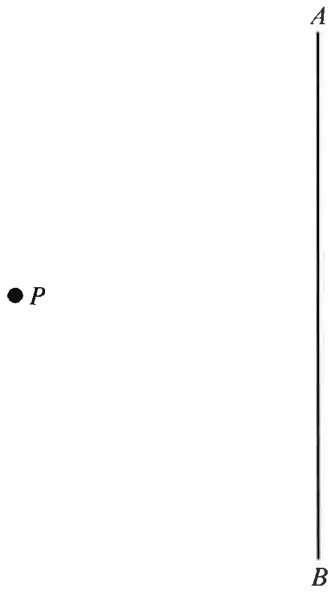
(1 mark)

b Draw a scale diagram to show the wall, ground and ladder.

Use your diagram to work out the length of ladder that Suki should buy.

(2 marks)

6 The diagram shows a point P, and a line AB.



Using a ruler and compasses, construct the line that is the shortest distance from P to the line AB.

(2 marks)

7 A triangle has sides of 33 cm, 56 cm and 65 cm.

Using ruler and compasses, construct an accurate scale drawing of this triangle.

State the scale you have used.

(3 marks)

8 Meera says, 'My scale drawing of the triangle in **Q7** is right angled, so a triangle with sides of 33 cm, 56 cm and 65 cm is a right-angled triangle.'

Jodie says this may not be true, because the triangle drawn to actual size may have different angles.

State who is correct and give a reason for your answer.

.....

.....

(1 mark)

Calculator

9 A map has a scale of 1 : 25 000

A road on the map is 5 cm long.

How long is the road in real life?

.....

(2 marks)

10 On a map, two towns are 8 cm apart.

The scale of the map is 1 : 50 000

a How far apart are the two towns in real life?

.....

(2 marks)

b One of the two towns is 6.5 km from a river.

What distance represents 6.5 km on the map?

.....

(2 marks)

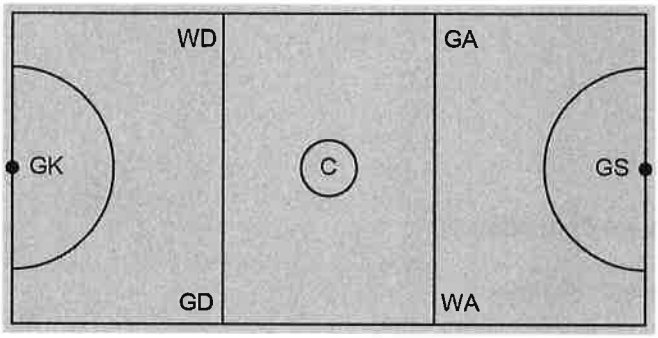
11 A map has scale 1 : 20 000

Work out what the distance 12 cm on the map represents in real life.

.....

(1 mark)

12 Here is a scale drawing of a netball pitch.



Each semicircle has diameter 9.76 metres.

a Explain how the groundskeeper could paint each semicircle on the pitch.

.....

.....

.....

.....

(1 mark)

b Estimate the length of the netball pitch.

.....m

(2 marks)

Overall mark	**/30**

NAME

Non-calculator

1 Solve $x^2 + 7 = 71$

giving the positive and negative solutions.

..... and .....

(2 marks)

2 Explain why the inequality $-3 < x < -2$ has no integer solutions.

.....

.....

(1 mark)

3 The table shows values of x and y.

x	1	5	25
y	50	250	1250

Show whether or not x and y are in direct proportion.

(2 marks)

4 Solve the equation $\frac{x+5}{3} = 6$

.....

(2 marks)

5 The formula connecting the values for x and y in the table can be written for y in terms of x as

$$y = \frac{k}{x}$$

x	2	4	10
y	2.5	1.25	0.5

a Find the value of k.

.....

(1 mark)

b Write the formula so that x is given in terms of y.

.....

(2 marks)

6 **a** Find the nth term of this fraction sequence

$$\frac{3}{4}, \frac{4}{7}, \frac{5}{10}, \frac{6}{13}, \ldots$$

.....

(2 marks)

b Show that $\frac{13}{34}$ is a term in this sequence.

(2 marks)

7 Solve the equation

$$\frac{3x+1}{5} = \frac{x+7}{3}$$

Show your working clearly.

.....

(4 marks)

Calculator

8 Here is a sequence of patterns made from counters.

Pattern 1 **Pattern 2** **Pattern 3**

a Complete the table to show the number of counters for patterns 1 to 5.

Pattern number	1	2	3	4	5
Number of counters					

(1 mark)

b The numbers of counters in the patterns form a sequence.

Work out the nth term of the sequence.

.....

(2 marks)

c Work out the number of counters in the 21st pattern.

.....

(2 marks)

d Jude makes the largest possible pattern with 60 counters.

How many counters are left over?

.....

(2 marks)

9 **a** Write down the term-to-term rule for this geometric sequence:

0.5, 3, 18, ...

.....

(1 mark)

b Find the next two terms.

....

(1 marks)

10 v and x are in direct proportion.

v	13.6	n	1.7
x	32.64	8.16	4.08

a Write a formula connecting v and x.

.....

(1 mark)

b Work out the missing value, n.

n = ...

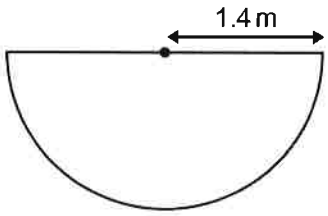
(2 marks)

Overall mark	**/30**

NAME

Non-calculator

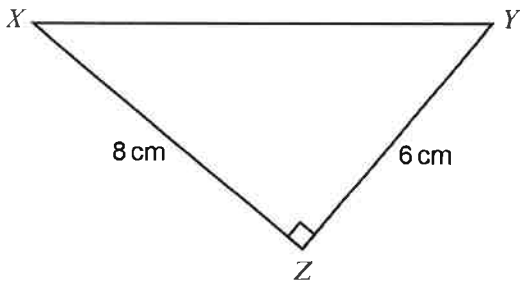
1 Write the calculation to work out the area of this semicircle.



.....

(2 marks)

2 Work out the length XY.



.....cm

(2 marks)

3 A florist tears paper off a roll to wrap flowers.

A 30 cm length of paper is torn off, to the nearest 10 cm.

a What is the upper bound of the length of paper?

.....cm

(1 mark)

b What is the lower bound of the length of paper?

.....cm

(1 mark)

c The paper is torn from a roll that is exactly 0.8 m wide.

Work out the upper and lower bounds for the area, A, of the paper.

Write your answer as an inequality.

.....

(2 marks)

4 The radius of a circular flower bed is 30.5 cm.

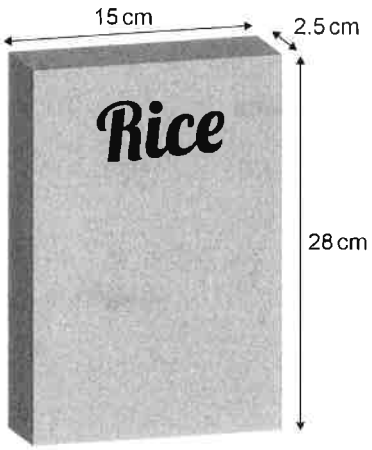
Work out the circumference of the flower bed.

Give your answer in terms of π in its simplest form.

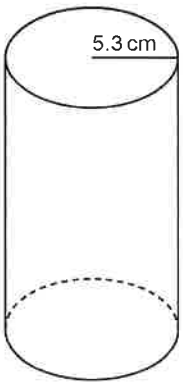
.....cm

(2 marks)

5 This box is filled completely with rice.



All the rice in the box is to be stored in this jar.



Work out the minimum height of the jar for all the rice to fit inside.

Give your answer correct to 1 decimal place.

..... cm

(3 marks)

6 A square has two diagonals, each 38 cm long.

Work out the perimeter of the square.

Give your answer correct to 1 decimal place.

.....cm

(3 marks)

7 A tub contains 1200 pins ± 1%.

Work out the minimum and maximum number of pins, p, in the tub.

Write your answer as an inequality.

.....

(2 marks)

Calculator

8 A circle has circumference 88 cm.

Work out the diameter of the circle.

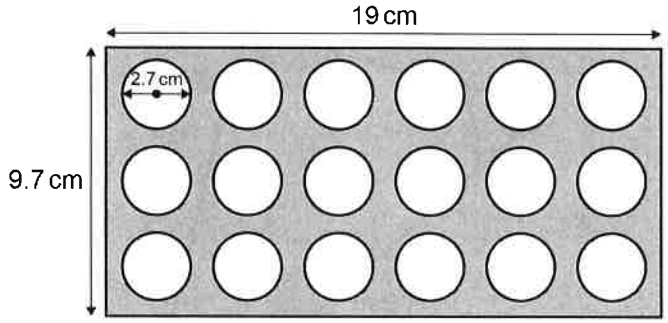
Give your answer correct to 1 decimal place.

.....cm

(2 marks)

9 The diagram shows a metal sheet.

Identical circular metal discs with diameter 2.7 cm are cut from the metal sheet.



What area of metal sheet is left?

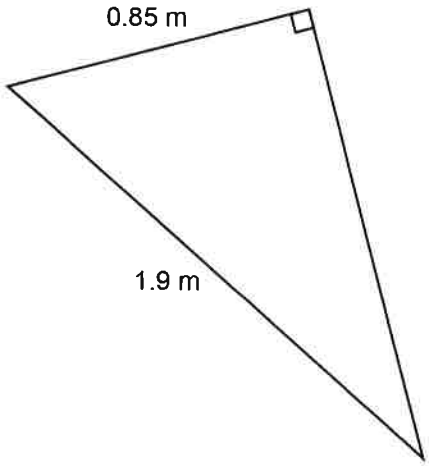
Give your answer correct to 1 decimal place.

..... cm^2

(3 marks)

10 Work out the area of this right-angled triangle.

Give your answer correct to 3 significant figures.



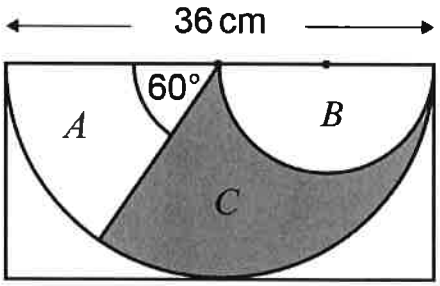
..... m^2

(3 marks)

11 Sarah draws a large semicircle to fit across a rectangular piece of paper.

She draws a sector A of the large semicircle.

Then she draws a smaller semicircle B to fit across half the large semicircle.



What is the area of the shaded shape (C)?

Give your answer correct to 3 significant figures.

.....cm^2

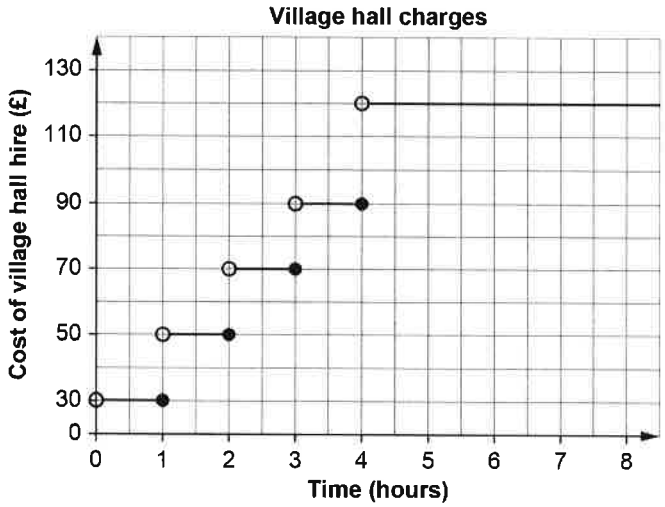
(4 marks)

Overall mark	**/30**

NAME

Non-calculator

1 The graph shows the charges for hiring a village hall.



a There is a $1\frac{1}{2}$ hour yoga class in the village hall.

How much is the hire charge?

£.....

(1 mark)

b How much does it cost to hire the village hall for 3 hours?

£.....

(1 mark)

c The village hall has a maximum hire charge.

What is the maximum charge?

£.....

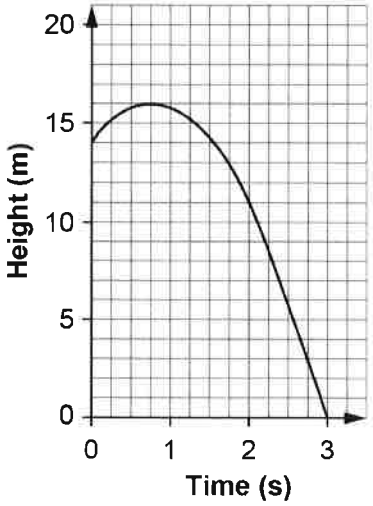
(1 mark)

d What is the cost for each additional hour if you hire the hall for 3 hours or less?

£.....

(1 mark)

2 The graph shows the path of a pebble thrown from a cliff into the sea.



a How high is the cliff?

.....m

(1 mark)

b What is the maximum height above sea level that the pebble reaches?

.....m

(1 mark)

c After how many seconds does the pebble hit the sea?

.....s

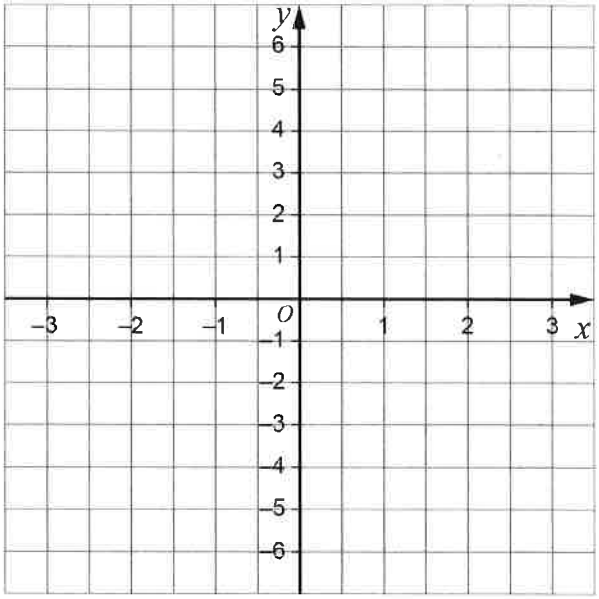
(1 mark)

3 a Complete this table of values for $y = x^2 - 4$

x	−3	−2	−1	0	1	2	3
x^2							
−4	−4	−4	−4	−4	−4	−4	−4
y							

(2 marks)

b Plot the points you found in part a to draw the graph of $y = x^2 - 4$ on the grid.



(2 marks)

4 Andy is A years old. His brother Ron is R years old.

Andy multiplies his own age by 3.

He then subtracts twice Ron's age.

The answer is 6.

Ron subtracts his age from Andy's age.

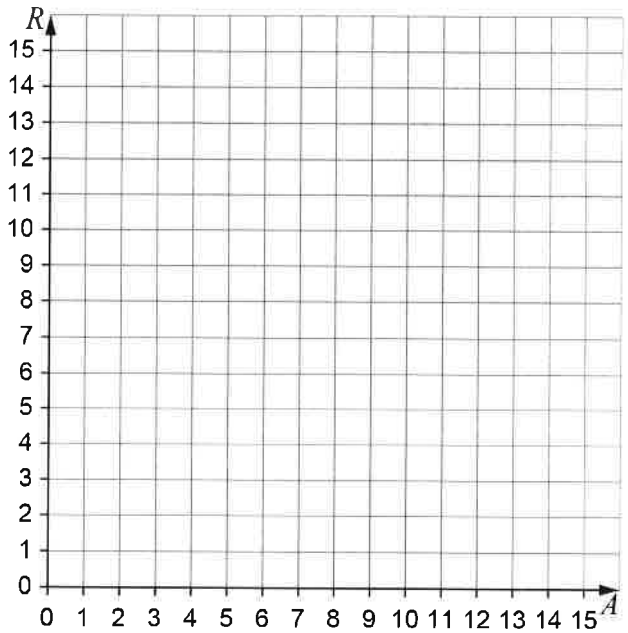
The answer is −2

a Write a pair of simultanous equations that model Andy's and Ron's ages.

..... and .....

(2 marks)

b On the grid, draw a graph to model the simultaneous equations in part **a**.



(4 marks)

c How old is Andy?

.....

(1 mark)

5 Decide whether this pair of equations has no solution, one solution or infinitely many solutions.

$4x - y = 12$

$2x - \frac{1}{2}y = 6$

Explain your answer.

.....

.....

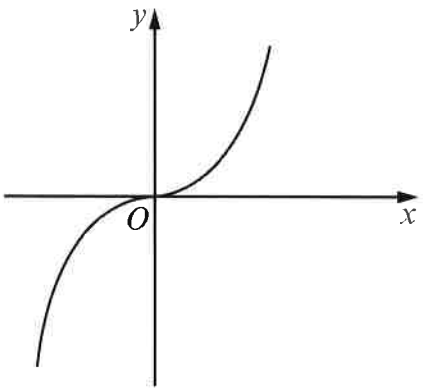
.....

.....

(2 marks)

6 Molly sketches this graph.

She says it is a quadratic graph.



a Explain how you know that Molly is incorrect.

.....

.....

(1 mark)

b What type of graph is Molly's sketch?

.....

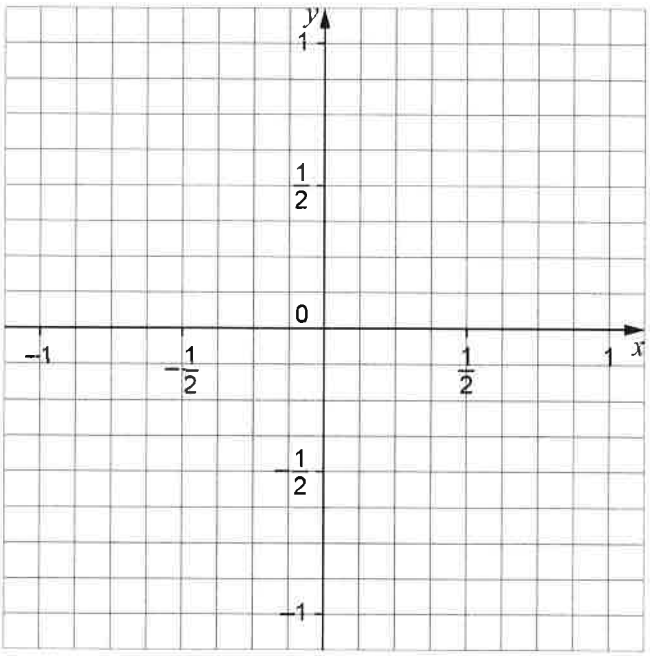
(1 mark)

7 Susie is thinking of two numbers.

When she adds the two numbers, the answer is 1.

When she subtracts one number from the other, the answer is $\frac{1}{2}$

a Write two equations to show this information and draw graphs of these two equations on the grid.



(3 marks)

b Use your graph to find the two numbers Susie is thinking of.

..... and .....

(1 mark)

8 Amir describes a line. He says:

'The gradient of my line is an integer.

My line is steeper than the line with the equation $-4x + y = 1$

It is less steep than the line with the equation $-6x + y = 1$

Write the gradient of Amir's line.

.....

(2 marks)

9 A rhombus is drawn on a coordinate grid.

One diagonal of the rhombus is a line with the equation $y = \frac{3}{2}x - 4$

It bisects the other diagonal at (0, −4).

Write the equation of the line for the other diagonal.

.....

(2 marks)

Overall mark	**/30**

NAME

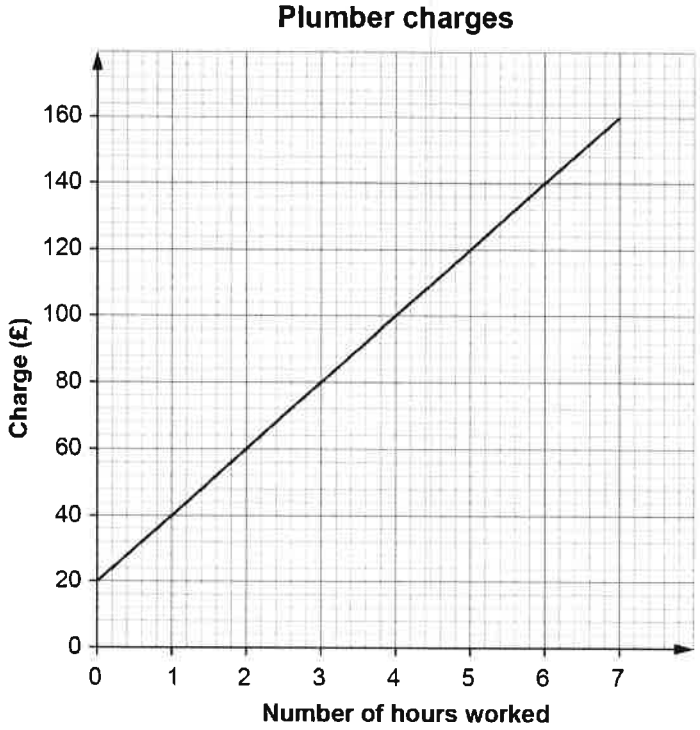
Non-calculator

1 Solve $3x - 5x = 8$

$x =$ .....

(1 mark)

2 The graph shows the amount a plumber charges her customers.



a The plumber charges a call-out fee. How much is it?

£.....

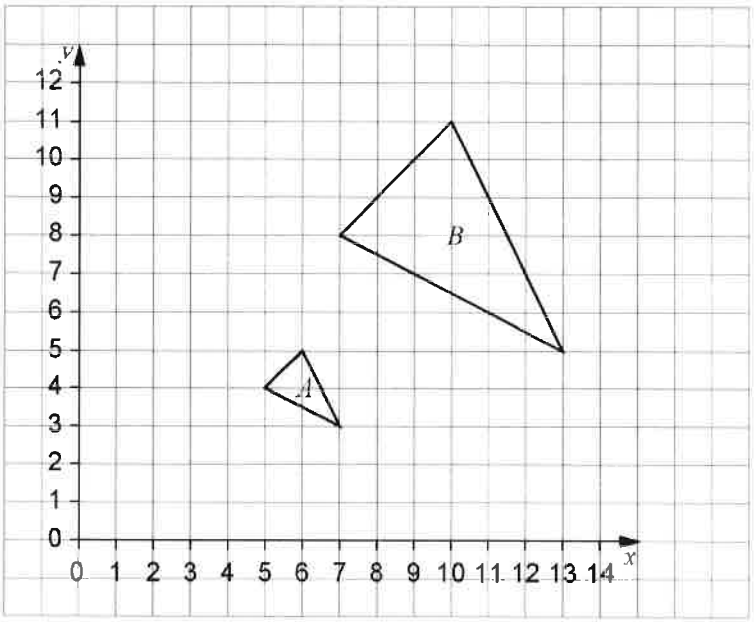
(1 mark)

b Write a formula for the total amount in pounds (£), C, that the plumber charges her customers for h hours' work.

.....

(2 marks)

3 Triangle A is enlarged to give triangle B.



a What is the scale factor of the enlargement?

.....

(1 mark)

b Write down the coordinates of the centre of enlargement.

(..... , ...)

(2 marks)

4 A councillor wants to find out if the people in her town use the local leisure centre.

She sends a questionnaire to the people who live in the two streets alongside the leisure centre.

a Explain why her results could be biased.

.....

.....

(1 mark)

b How could she reduce the bias?

.....

.....

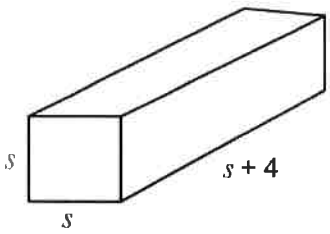
(1 mark)

5 Solve $\frac{x}{4} - 5 = -2$

.....

(2 marks)

6 Here is a cuboid.



Show that an expression for the volume of the cuboid is $s^3 + 4s^2$

(1 marks)

7 Work out $(-4)^5 \div (-4)$

Write your answer as a power of 4

.....

(1 mark)

8 Chen is converting 80 km/h into mph.

He knows that 1 mile ≈ 1.6 km.

He works out

$80 \times 1.6 = 128$ mph

What mistake has Chen made?

(1 mark)

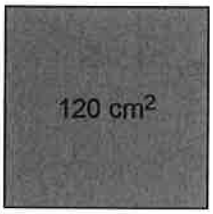
9 Write 3^{-2} as a fraction.

.....

(1 mark)

10 A square has an area of 120 cm^2.

Estimate the length of one of its sides.



.....

(2 marks)

11 The grouped frequency table below shows the reaction times (in seconds) of 120 students.

Reaction time, t (seconds)	Frequency
$0 \leq t < 0.2$	39
$0.2 \leq t < 0.4$	64
$0.4 \leq t < 0.6$	11
$0.6 \leq t < 0.8$	6

Show that an estimate of the mean reaction time per student falls within the modal class.

(4 marks)

12 Work out $5^3 \div 5^5$

Give your answer as a fraction.

.....

(2 marks)

13 Make x the subject of the formula $y = 3x - 6$

.....

(2 marks)

Calculator

14 You can use this formula to calculate speed.

$$S = \frac{D}{T}$$

Work out the value of D when $S = 86$ and $T = 0.9$

.....

(1 mark)

15 Poppy buys a bicycle for £400

Three years later, she sells it for £176

What percentage loss has she made?

.....

(2 marks)

16 A speed boat travels 130 km at a speed of 104 km/h.

For how long does the boat travel?

Give your answer in hours and minutes.

.....

(2 marks)

17 Work out 0.035×0.8

Write your answer in standard form.

.....

(1 mark)

18 $3^3 \times 3^n = 3^7$

Work out the value of n.

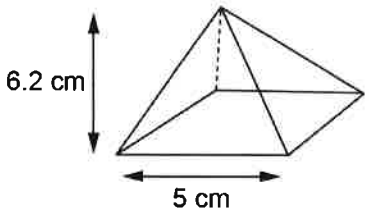
.....

(1 mark)

19 You can use this formula to calculate the volume of a pyramid

$$V = \frac{1}{3} l^2 h$$

where l is the side of the base, and h is the vertical height.



Work out the volume of this square-based pyramid.

Give your answer to the nearest cm^3

.....cm^3

(2 marks)

20 Show that $(a - 12)(a + 2) - (a - 3)(a - 7) = -45$

(3 marks)

21 A plant pot is put on a stool.

The stool has three legs. Each leg has a square base measuring 5 cm by 5 cm.

The force produced by the mass of the plant and the stool is 635 N.

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

Work out the pressure on the floor of the plant pot and the stool.

Give your answer to 2 decimal places.

..... N/cm²

(3 marks)

Overall mark	**/40**

NAME

Non-calculator

1 The nth term of a sequence is $9 - 2n$

a Work out the first three terms of the sequence.

.....

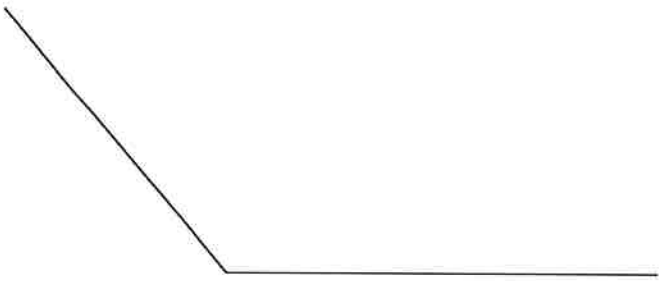
(2 marks)

b Work out the 20th term of the sequence.

.....

(1 mark)

2 Construct the angle bisector of this obtuse angle.



(2 marks)

3 **a** Construct a triangle with sides 3 cm, 5 cm and 6 cm.

(2 marks)

b Construct the perpendicular bisector of the longest side of your triangle.

(2 marks)

4 **a** Solve the inequality $3 + x \geq 12$

.....

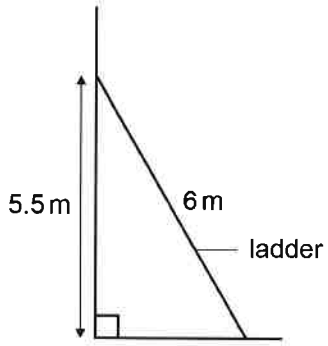
(1 mark)

b Solve the inequality $\frac{x}{3} \leq 6$

.....

(1 mark)

5 The diagram shows a ladder leaning against a wall.



a Make an accurate scale drawing of this diagram.

(2 marks)

b How far is the base of the ladder from the base of the wall?

..... m

(1 mark)

6 5 melons cost £3.50

7 melons cost £5

Are the number of melons and the cost in direct proportion? Explain how you know.

.....

.....

.....

.....

(2 marks)

7 The radius of a circular table is 0.4 m.

Work out the circumference of the table.

Give your answer in terms of π.

.....

(2 marks)

8 Is this sequence geometric, arithmetic, or quadratic?

5, 8, 13, 20, ...

Explain how you know.

.....

.....

.....

.....

(2 marks)

9 A packet of carrot seeds contains 1500 seeds ± 2%.

Work out the minimum and maximum number of carrot seeds, s, in the packet.

Write your answer as an inequality.

.....

(2 marks)

10 Here are the second, third and fourth terms of a quadratic sequence.

____, 7, 11, 17, ____

Show that the fifth term of this quadratic sequence is the square of the first term.

(3 marks)

Calculator

11 UK pounds (£) are in direct proportion to euros (€).

£20 buys €21.70

How many euros will £48 buy?

€.....

(2 marks)

12 The diameter of a bracelet is 17.8 cm.

Work out its circumference.

Round your answer to an appropriate degree of accuracy.

.....cm

(2 marks)

13 Solve $x^2 - 1 = 50$ giving the positive and negative solutions to 1 decimal place.

..... and .....

(3 marks)

14 A cloth of length 9 m is cut to the nearest 10 cm.

a What is the lower bound of the length of the cloth?

.....

(1 mark)

b The cloth is cut from a roll that is exactly 1.6 m wide.

Work out the lower bound for the area of the piece of cloth.

.....

(1 mark)

15 The table shows values of s and t.

s	0.2	0.5	1.4
t	7.5	3	0.9

Is s inversely proportional to t? Explain why.

.....

.....

.....

.....

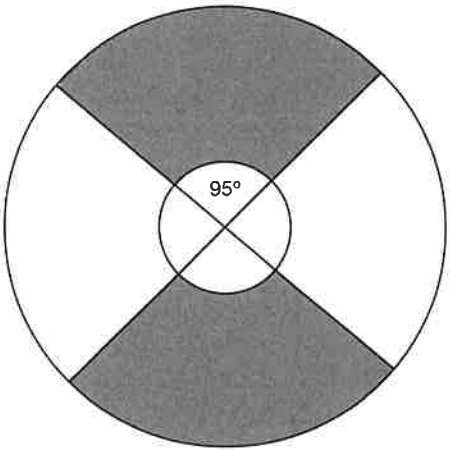
(2 marks)

16 Two straight lines pass through the centre of two concentric circles at an angle of 95°.

The small circle has radius 1.1 cm.

The large circle has radius 3.8 cm.

Work out the shaded area.



..... cm^2

(4 marks)

Overall mark	**/40**

NAME

Non-calculator

1 When a coin is picked at random from a bag, the probability of it begin a 5p coin, a 10p coin or a 20p coin is as follows.

P(5p) = 15%, P(10p) = 8%, P(20p) = 12%

Give the probability that a coin picked at random from the bag is

a a 5p coin or a 10p coin

.....%

(1 mark)

b not a 5p coin, a 10p coin or a 20p coin.

.....%

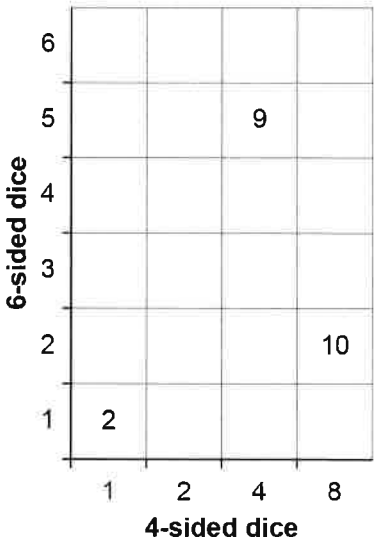
(2 marks)

2 An ordinary dice and a four-sided dice are rolled.

The numbers on the four-sided dice are 1, 2, 4, 8.

The scores on the two dice are added together.

Complete this sample space diagram to show all the possible outcomes.



(2 marks)

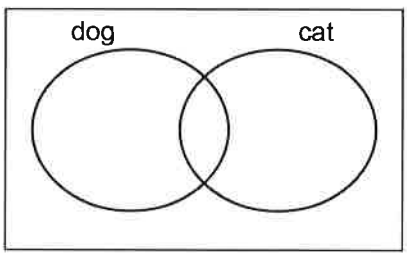
3 In a group of 70 people

32 have a dog

15 have a dog and a cat

18 have no dog and no cat.

a Complete the Venn diagram to show this information.



(3 marks)

One of these people is picked at random.

b Work out the probability that they have a cat but not a dog.

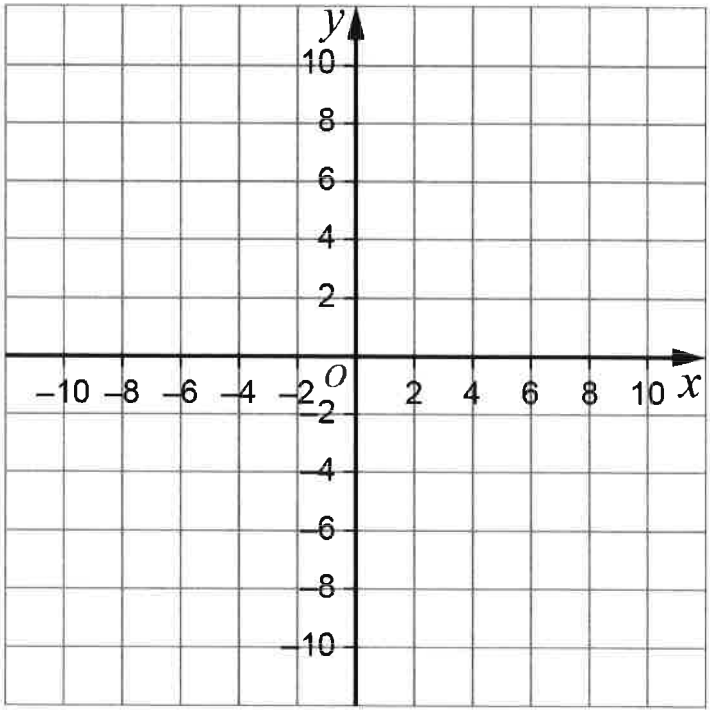
.....

(1 mark)

4 a On the grid, draw graphs with the following equations.

i) $x + y = 9$

ii) $5x - 2y = 10$



(2 marks)

b Using your graphs, find the solution to the simultaneous equations

$x + y = 9$

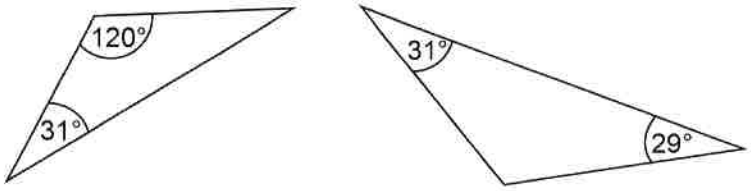
$5x - 2y = 10$

$x =$ .....

$y =$ .....

(2 marks)

5 Explain why these two triangles are similar.



.....

.....

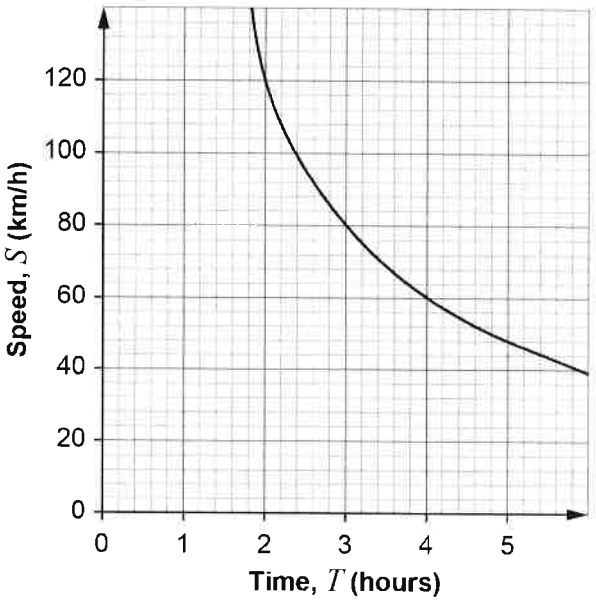
.....

.....

(2 marks)

6 A lorry regularly travels a distance of 240 km between two warehouses.

The graph shows the relationship between the lorry's average speed and the time it takes on some of these journeys.



Here is a table of values from the graph.

Time, T (hours)	2	2.5	3	5
Speed, S (km/h)	120	96	80	48

a The relationship between T and S is $S = \frac{k}{T}$

Use values from the table to work out the value of k.

k = ...

(2 marks)

b Write an equation connecting T and S for the lorry.

.....

(1 mark)

7 A right-angled triangle has width x cm and height x cm.

a Write a formula for the area, A cm^2, in terms of x.

.....

(2 marks)

b On the grid, plot the graph of A for $x = 0$ to $x = 6$

(2 marks)

c Use your graph to estimate the height (or width) of the right-angled triangle when the area is 3 cm^2.

.....cm

(1 mark)

8 A kite is drawn on a coordinate grid.

One diagonal, D, of the kite is a line with the equation $y = \frac{1}{4}x + 3$

D bisects the other diagonal at the point with coordinates (0, 3).

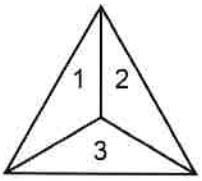
Write the equation of the line for the other diagonal.

.....

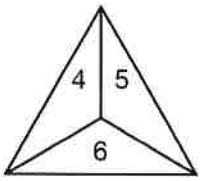
(2 marks)

Calculator

9 The diagram shows two fair spinners.



Spinner 1



Spinner 2

A game is played where players spin both spinners once to get two scores.

They add their two scores to get a total.

If the total is 6, the player wins 50p

It is 20p to play the game.

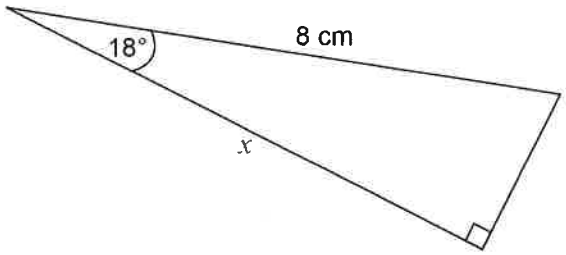
The game is played 180 times.

Estimate the profit the game makes.

£.....

(3 marks)

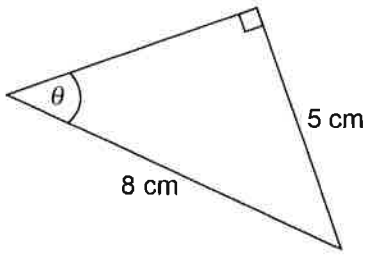
10 Use the cosine ratio to work out the value of x.



.....°

(2 marks)

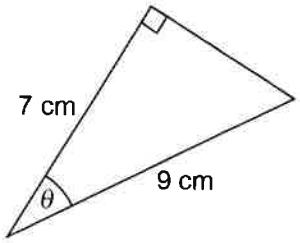
11 Use the sine ratio to work out the size of angle θ.



.....°

(2 marks)

12 Use the cosine ratio to work out the size of angle θ.



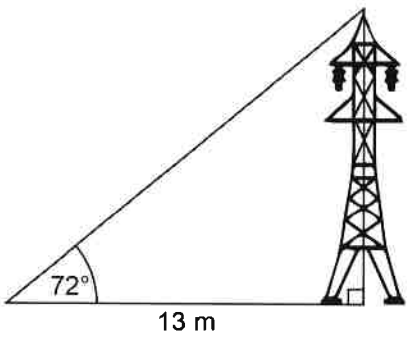
..... °

(2 marks)

13 A farmer wants to know the height of a pylon on his land.

He measures 13 metres from the bottom of the pylon to a point on the ground.

The angle to the top of the pylon is 72°.



Use the tangent ratio to work out the height of the pylon.

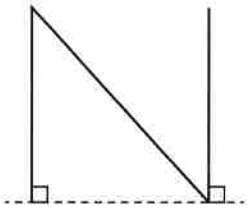
Give your answer to an appropriate degree of accuracy.

..... m

(2 marks)

14 A company has a logo that is a letter N.

The N is made of 3 pieces of wood, 2 upright pieces and a diagonal as shown in the diagram.



The company builds a large wooden N to sit outside its main office.

The height of the letter N is 2.8 m.

The diagonal of the letter N makes an angle of 44° with the ground.

Work out the total length of wood needed to make the letter N.

.....m

(4 marks)

Overall mark	**/40**