

NAME

Non-calculator

1 Here are two sets of data.

Set A: 15, 17, 14, 19, 16, 18, 17, 16

Set B: 6, 20, 15, 14, 20, 20, 20, 10

a Which set has the higher median? You must show your working.

.....
(1 mark)

b Which set of data is more consistent? Explain your answer.

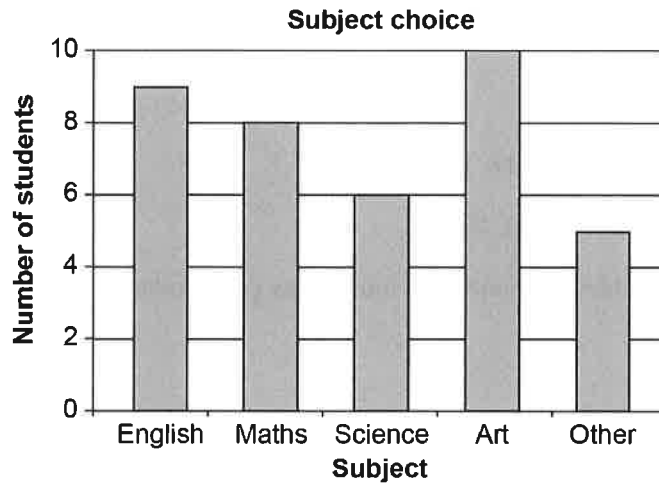
(1 mark)

c Write a set of eight data values with median 15 and mode 13.

(1 mark)

2 Some students were asked, 'What is your favourite subject at school?'

The bar chart shows the results.



a Work out the total number of students that were asked.

(1 mark)

b Draw a pictogram for this data. It has been started for you.

English	☉ ☉ ☉ ☉ ◐
Maths	
Science	
Art	
Other	

Key:

(2 marks)

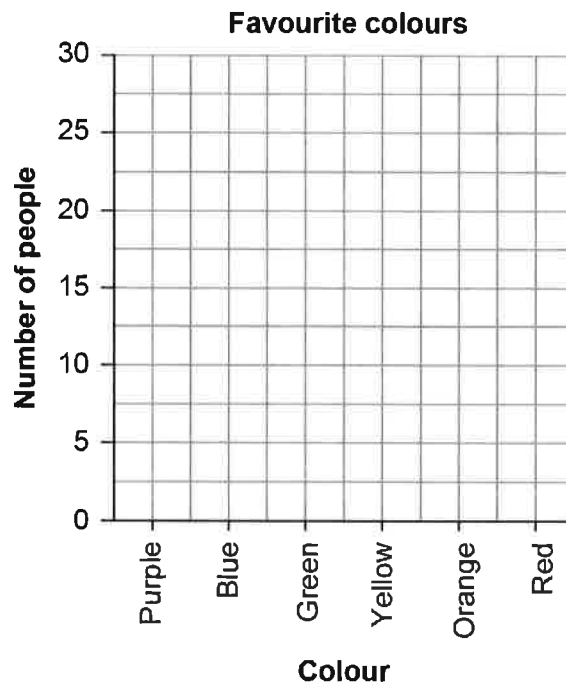
3 Maya asked people their favourite colour.

The table shows her results.

Colour	Purple	Blue	Green	Yellow	Orange	Red
Number of people	5	25	20	30	10	15

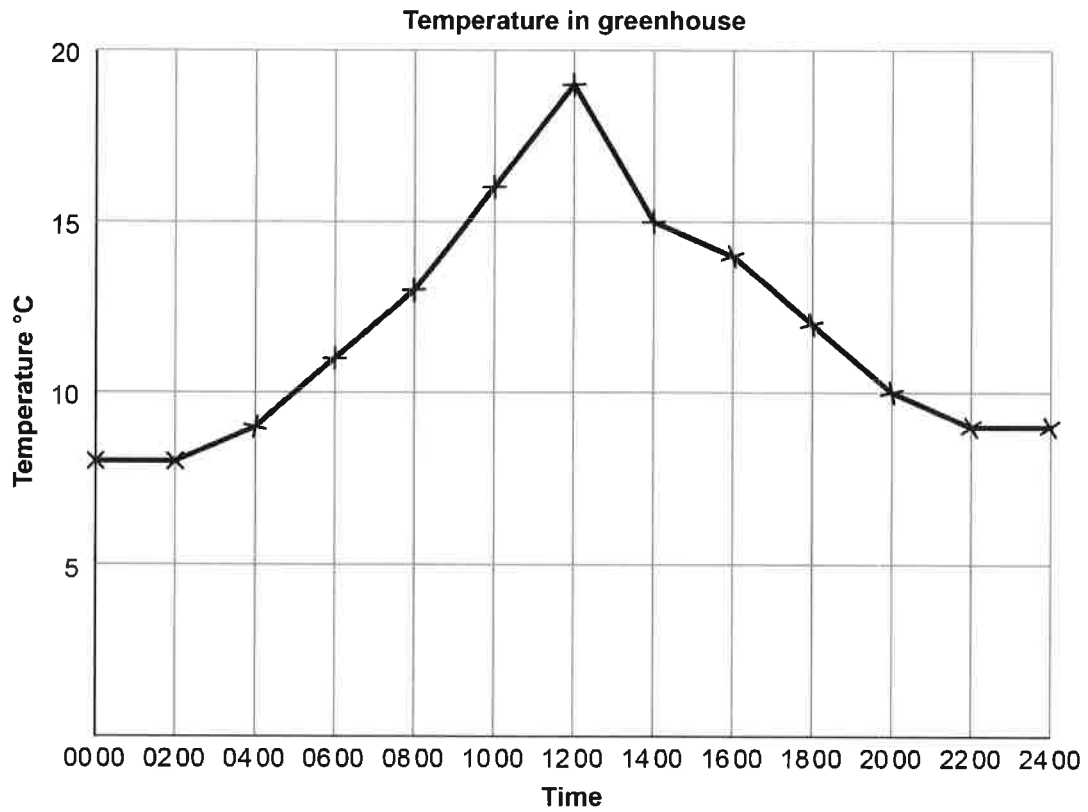
Draw a bar-line chart for the data. Use the axes in the graph.

(2 marks)



4 Sanjit records the temperature ($^{\circ}\text{C}$) in a greenhouse every 2 hours.

The graph shows the temperatures ($^{\circ}\text{C}$) for 24 hours, starting at midnight (0000).



a For how many hours was the temperature 9°C or warmer?

.....

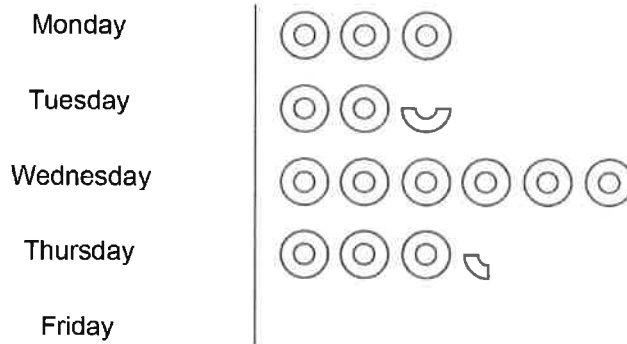
(1 mark)

b Use the graph to estimate the temperature at 11 00 .

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

(1 mark)

- 5 The pictogram shows the number of donuts Andy sold on Monday, Tuesday, Wednesday and Thursday.



Key: ⊙ symbol represents 4 donuts

Andy sold 23 donuts on Friday.

- a Complete the pictogram for Friday.

(1 mark)

- b i Work out the mean number of donuts sold each day.

.....

(1 mark)

- ii Work out the median number of donuts sold each day.

.....

(2 marks)

- c Which of these averages best describes the number of donuts sold each day? Give a reason.

.....

(1 mark)

6 Here are the ages of some of the children in a holiday club.

Children ages 4-6 and 10-12 have already been counted.

Their tallies and frequencies have been added to the table below.

8 9 7 8 8 7
8 7 9 7 7

a Complete the table with the remaining data.

Age (years)	Tally	Frequency
4-6		8
7-9		
10-12		9

(1 mark)

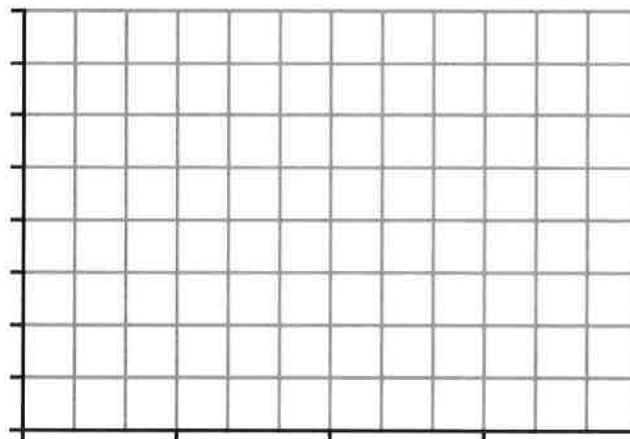
b Find the modal class of the data.

.....

(1 mark)

c Draw a bar chart to show the data on the axes in the grid below.

(2 marks)



The range of the data is 7 years.

The youngest child is 4 years old.

- d Work out the age of the oldest child.

.....
(1 mark)



Calculator

- 7 Mr Brown and Mrs Patel grow pumpkins.

Here are the weights of Mr Brown's pumpkins.

6.0 kg 8.3 kg 5.1 kg 3.5 kg 5.9 kg 3.6 kg 5.6 kg 7.6 kg

Here is some information about Mrs Patel's pumpkins.

Mean = 6.1 kg

Range = 5.0 kg

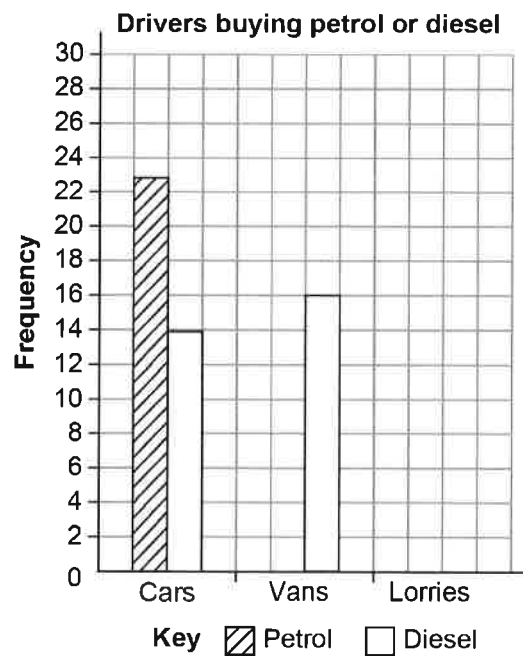
Use the range and the mean for each set of data to compare the weights of Mr Brown's and Mrs Patel's pumpkins.

.....
(2 marks)

- 8 A garage owner records the numbers of car, van and lorry drivers buying petrol or diesel.

The table and the dual bar chart show some of the information.

	Car	Van	Lorry
Petrol		7	4
Diesel			28



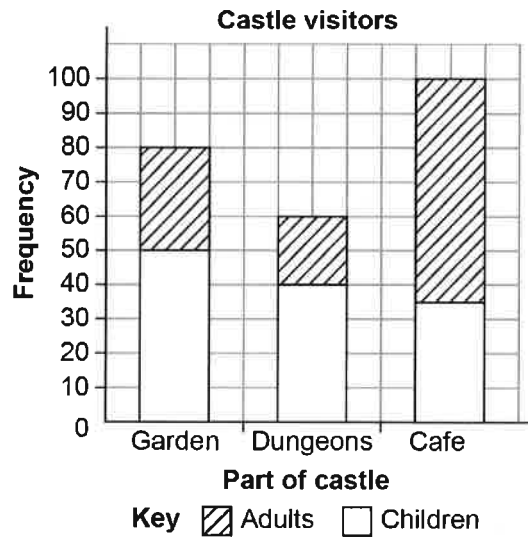
- a Use the information to complete the table and the dual bar chart.

(2 marks)

- b How many drivers bought petrol?

.....
(1 mark)

10 The compound bar chart shows the numbers of people who visited different parts of a castle one Saturday.



a How many children visited the dungeons?

.....
(1 mark)

b How many adults visited the cafe?

.....
(1 mark)

c The gardener says, 'Twice as many children as adults visited the garden.'

Is the gardener correct? Explain your answer.

(1 mark)

Overall mark	/30
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NAME

Non-calculator

1 Work out $-9 + 6$

.....
(1 mark)

2 Work out $4^2 \times (8 + 7)$

.....
(2 marks)

3 Work out $476 \div 14$

.....
(2 marks)

4 Rohan says, 'The lowest common multiple of 6 and 10 is 60.'

Explain why Rohan is not correct.

.....
.....
(1 mark)

- 5 Grant says, 'Multiplying any number by 3 will always give an answer greater than zero.'

Grant is not correct.

Write down a calculation to show this.

(1 mark)

- 6 Tammy's laptop cost £400

Clare's laptop cost twice as much as Tammy's.

Eva's laptop cost £145 less than Clare's.

What is the cost of Eva's laptop?

.....
(3 marks)

- 7 Amy writes down a positive whole number.

Her number has a remainder of 5 when divided by 6

Her number has more than two factors.

Work out the lowest possible number that Amy could have written down.

.....
(2 marks)

8 A climber records the temperature every 1000 metres, as she climbs.

Here are her results

15 °C 10 °C 3 °C -4 °C -11 °C -19 °C

What is the range of temperatures?

.....°C

(2 marks)



Calculator

9 Calculate $\sqrt{289}$

.....

(1 mark)

10 Two shops sell newspapers on Monday.

On Monday Shop **A** sold 1092 newspapers.

On Monday Shop **B** sold 217 fewer newspapers than Shop **A**.

Work out the total number of newspapers sold by the two shops on Monday.

.....

(3 marks)

11 Amina buys a games console and some games.

The total cost is £650

Amina's mum pays £225 towards the cost.

Amina pays the remaining amount in two equal monthly payments.

a How much does she pay each month?

£.....

(3 marks)

b Explain why paying the remaining amount in six equal monthly payments would not be possible.

.....

.....

(1 mark)

12 New Street car park charges £7.20 per day.

Mr Taylor and his son both park their cars in New Street car park for the day.

Mr Taylor buys both their tickets. He pays with a £20 note.

How much change does he get?

.....

(3 marks)

13 Jon has 200 square paving stones.

He uses some to make a square patio.

Show that the largest number of paving stones he can use is 196

(2 marks)

14 Simon has half as many emails in his inbox as Polly.

Polly has three times as many emails in her inbox as Kamal.

Kamal has 28 emails in his inbox.

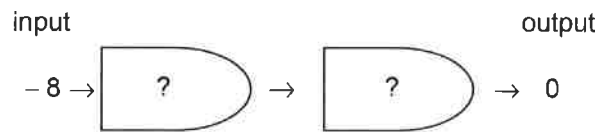
How many emails are in Simon's inbox?

.....
(3 marks)

Overall mark	/30
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d Here is a two-step function machine.

An input of -8 gives an output of 0 .



What could the functions be?

..... and
(1 mark)

2 Simplify

a $p + 5p - 3p$

.....
(1 mark)

b $2a + 3b - 4 - 5a + b$

.....
(2 marks)

3 a Expand

$4(3x + 2)$

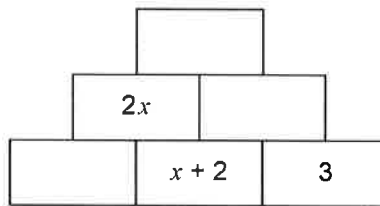
.....
(1 mark)

b Expand and simplify $5(2d - 3) + 3(d + 7)$

(2 marks)

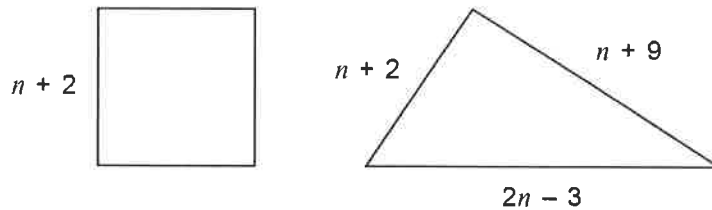
4 In this addition pyramid, each brick is the sum of the two bricks below it.

Complete the addition pyramid.



(2 marks)

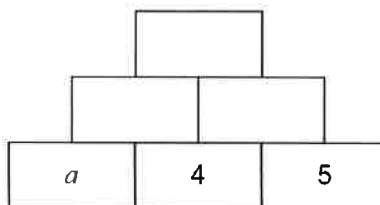
5 Show that this square and this triangle have the same perimeter.



(2 marks)

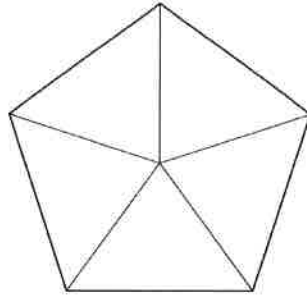
6 In the multiplication pyramid, each brick is the product of the two bricks below it.

Complete the multiplication pyramid.



(2 marks)

- 7 A regular pentagon is divided into five identical isosceles triangles.

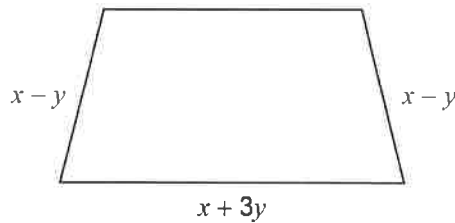


The area of the regular pentagon is $B \text{ cm}^2$.

Write a formula for T , the area of one of the triangles.

.....cm
(1 mark)

- 8 The lengths of three sides of the trapezium are as shown on the diagram.



The perimeter of the trapezium is $5x - 2y \text{ cm}$.

Find the length of the fourth side.

Write your answer in its simplest form.

.....cm
(2 marks)

9 A rectangle has length x cm.

The width of the rectangle is 3 cm less than its length.

The rectangle has perimeter p cm.

Write a formula for the perimeter of the rectangle.

Give your formula in its simplest form.

.....
(2 marks)

10 A shop is open for

p hours on each weekday from Monday to Friday

2 hours a day less on Saturday and Sunday.

Write an expression in its simplest form for the total number of hours the shop is open each week.

.....
(2 marks)

**Calculator**

11 Simplify

a $3f \times 5$

.....
(1 mark)

b $\frac{18x}{6}$

.....
(1 mark)12 The perimeter p cm of an equilateral triangle is given by the formula

$$p = 3c$$

where c is the length of one of the sides in centimetres.Work out the perimeter when $c = 6.4$ cm.....cm
(1 mark)13 In a pond, the number of fish (f) after k years is given by the formula

$$f = 800 - 73k$$

Work out the number of fish after 6 years.

.....
(2 marks)

14 A formula for the acceleration of a car, a m/s², is

$$a = \frac{v - u}{t}$$

where u m/s is the initial speed, v m/s is the final speed and t is the time taken in seconds.

Calculate the acceleration of a car when $u = 13.9$ m/s, $v = 22.4$ m/s and $t = 25$ seconds.

..... m/s²

(2 marks)

Overall mark	/30
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NAME

Non-calculator

1 Using a pencil and a ruler, draw a line 8.4 cm long.

.....
(1 mark)

2 a Work out $5.62 \div 1000$

.....
(1 mark)

b Judy multiplies a number by 100. Her answer is 29.4

Write down her calculation.

.....
(2 marks)

3 $13 \times 7 = 91$

Without doing any calculations, write down the answer to 1.3×0.7

.....
(1 mark)

4 Two students compare their heights.

Mike is 5 feet tall.

Anna is 5 cm taller than Mike.

Estimate Anna's height in cm.

.....cm

(2 marks)

5 Write these lengths in descending order.

1020 mm 1.2 m 201 cm 2 m

.....

(3 marks)

6 Andy enters $24.78 \div 11.8$ on his calculator.

He gets the answer 21.

Without working out the exact answer, explain how you know Andy did not enter the calculation correctly.

.....

.....

.....

.....

(2 marks)

7 Four students each record the mass of their pet.

Here are their results

3.42 kg 1420 g 5.5 kg 985 g

Work out the median mass in grams.

.....g

(3 marks)

8 a Jim says that 0.3×0.2 is 0.6

Explain why Jim is not correct.

.....

.....

(1 mark)

b $0.342 \times 65 = 22.23$

Use this fact to work out $2.223 \div 3.42$

.....

(1 mark)

**Calculator**

9 A piece of string is 108.5 cm long.

It is cut into 7 equal pieces.

What is the length of each piece of string?

..... cm

(2 marks)

10 A rug is in the shape of a regular hexagon.

It has side length 3.45 m.

Work out the perimeter of the rug.

Write down the units with your answer.

.....
(3 marks)

11 Maneet says, 'It is possible to draw a rectangle 40 mm wide with area 20 cm².'

Show that Maneet is correct.

(3 marks)

12 Alice uses a calculator to work out an amount of flour, in kg. Her calculator shows 1.3

She says, 'I need 1 kg and then another 3 g of flour'.

Explain why Alice is not correct.

.....

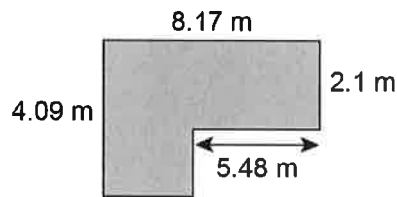
.....

.....

.....

(2 marks)

13 Work out the area of the shape. Give your answer to 2 decimal places.



.....m²

(3 marks)

Overall mark	/30
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NAME

Non-calculator

1 a Write $\frac{3}{20}$ as a decimal.

.....
(1 mark)

b Write $\frac{320}{500}$ as a decimal.

.....
(1 mark)

2 Complete

$$\frac{3}{5} = \frac{12}{\boxed{}}$$

(1 mark)

3 Write these fractions in ascending order.

$$\frac{3}{8}, \frac{1}{8}, \frac{7}{8}, \frac{5}{8}$$

.....
(1 mark)

- 4 Write $\frac{14}{5}$ as a mixed number.

.....
(1 mark)

- 5 An improper fraction is equal to a whole number and a fraction of $\frac{5}{6}$ as shown.

Work out the missing numbers.

$$\frac{17}{\square} = \square \frac{5}{6}$$

.....
(2 marks)

- 6 Work out $\frac{1}{12} + \frac{7}{12}$

Give your answer in its simplest form.

.....
(2 marks)

7 a Write 0.36 as a fraction in its simplest form.

.....
(1 mark)

b Work out 0.36×25

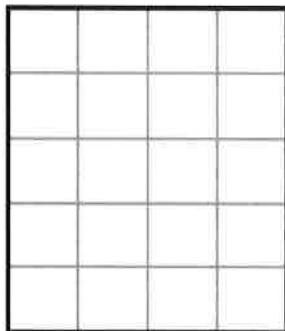
.....
(1 mark)

8 Work out $\frac{13}{15} - \frac{8}{15}$

Give your answer in its simplest form.

.....
(2 marks)

9 Shade 15% of this diagram.



(1 mark)

10 Which is smaller, 4.312 or $\frac{22}{5}$?

You must show working to support your answer.

.....
(2 marks)

11 There are 136 people on a train.

34 of the people are children.

What percentage of the people on the train are adults?

..... %
(2 marks)

12 Write 180 grams as a percentage of 1 kilogram.

..... %
(2 marks)



Calculator

13 There are 120 books in a shop.

$\frac{3}{4}$ of the books are cookbooks.

How many of the books are cookbooks?

.....

(2 marks)

14 There are 25 students in a class.

7 of the students are left-handed.

What percentage of the students are left-handed?

..... %

(2 marks)

15 Ray says, '70% of £45 is £3.15'

Ray is wrong. Explain why.

.....

(1 mark)

16 This year a train ticket costs £24.97

Last year a train ticket for the same journey cost £22.70

Write this year's cost as a percentage of last year's cost.

..... %

(2 marks)

17 A café adds 15% service charge to a bill.

Work out the service charge for a bill of £57.95

Give your answer correct to the nearest penny.

£

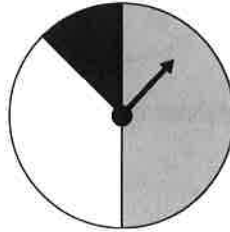
(3 marks)

Overall mark	/30
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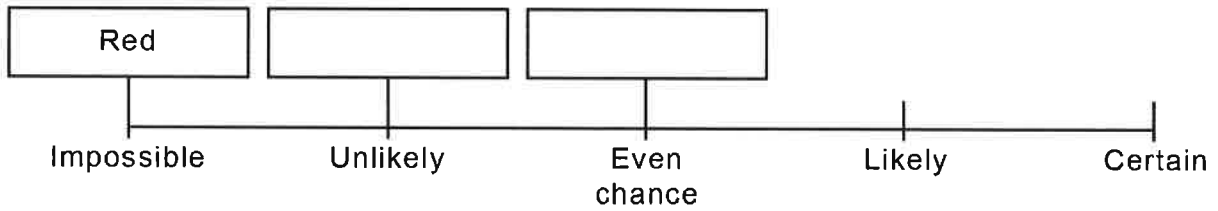
NAME _____

Non-calculator

1 For this spinner, write an event in each box on the probability scale.

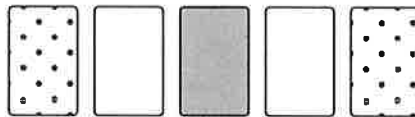


One has been done for you.



(2 marks)

2 a Here is a set of cards.



The probability that a white or grey card is picked is $\frac{3}{5}$

Work out the percentage probability that the card picked is not grey.

.....%

(1 mark)

b Which card of white, grey or dotted is half as likely to be picked as each of the other two?

Explain your answer.

.....

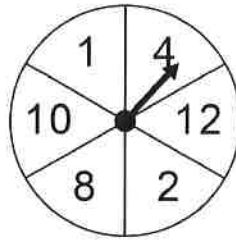
.....

.....

.....

(2 marks)

3 a This fair spinner is spun once.



Write down the possibility that the spinner lands on

i a multiple of 4

.....

(1 mark)

ii a 3

.....

(1 mark)

b Write down an event for this spinner that has probability $\frac{5}{6}$

.....

(1 mark)

4 A shape is picked at random from these 5 shapes.



a Work out $P(\text{not grey})$.

.....

(1 mark)

b Show that the probability of picking a 2D shape is the same as the probability of picking a shape with no curved edges.

.....

.....

(1 mark)

c Work out $P(\text{shape with 6 vertices})$.

.....

(1 mark)

5 A bag contains red and blue balls.

Red is three times more likely to be picked than blue.

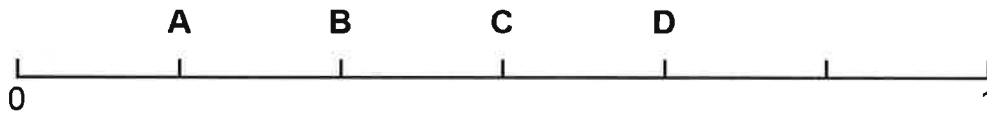
Work out $P(\text{Red})$.

.....

(1 mark)

6 Andy rolls a fair dice.

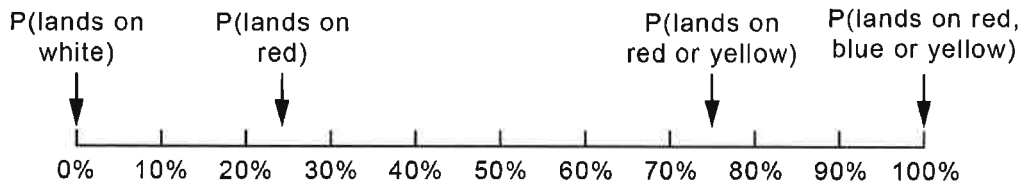
Match each letter on the probability scale to an outcome from the list below.



- Rolling a prime number
- Rolling a number greater than 5
- Rolling a number less than 5
- Rolling a square number

(3 marks)

7 The probability scale shows the probabilities of outcomes from spinning a fair spinner.



a Design a spinner with these probabilities.

(2 marks)

b Mark P(blue) on the probability scale.

(1 mark)



Calculator

8 The diagram shows a fair spinner.

The spinner is spun 450 times and the colour the arrow lands on each time is noted.



How many times would you expect the arrow to land on grey?

.....
(2 marks)

9 The table gives information about the numbers of visitors to a zoo on Monday to Friday one week during term time.

Number of child visitors	Number of adult visitors
44	156

a Estimate the percentage probability that a visitor picked at random is a child.

..... %
(2 marks)

b In another term time week, the zoo has 150 visitors.

Estimate the expected number of adult visitors this week.

.....
(2 marks)

- c Explain why your estimate in part a may not accurately predict the percentage of child visitors in a week in the school holidays.

.....

.....

(1 mark)

- 10 Alex and Chris play noughts and crosses every week.

One week they play 23 games.

Alex wins 13 of the games and loses 5 of the games. The other games are drawn.

The next week, Alex and Chris play 27 games of noughts and crosses.

Estimate the expected number of games of noughts and crosses that Alex and Chris will draw.

.....

(3 marks)

- 11 Paul has 35 cards and each card has a number greater than 0 written on it.

$P(\text{the number on the card is 20 or less}) = 80\%$

Work out the number of cards that have a number greater than 20 written on them.

.....

(2 marks)

Overall mark	/30
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NAME

Non-calculator

1 A recipe for 4 people uses 350 g of mince.

a How much mince is needed for 2 people?

.....g
(1 mark)

b How much mince is needed for 6 people?

.....g
(2 marks)

2 Rohan says that the ratio 12 : 18 is equivalent to the ratio 3 : 6

Show working to explain why Rohan is not correct.

.....

.....

.....

.....

(2 marks)

3 There are 20 different trails in a forest.

6 of the trails are easy.

What proportion of the trails are easy?

Give your answer as a percentage.

..... %

(2 marks)

4 A 200 ml can of energy drink contains 12 g of sugar.

How much sugar is there in a 300 ml can of energy drink?

..... g

(3 marks)

5 Ali makes a salad dressing.

He uses vinegar and oil in the ratio 1 : 3

What proportion of Ali's salad dressing is oil?

.....

(1 mark)

- 6 A garden centre charges 1.5 times as much per bulb for the September offer than for the October offer.

<p>September offer</p> <p>5 bulbs for</p> <div style="border: 1px solid black; width: 80px; height: 25px; margin: 0 auto;"></div>
--

<p>October offer</p> <p>12 bulbs for</p> <p>£2.40</p>
--

What is the cost of the September offer?

£.....
(4 marks)

- 7 Alex, Ben and Carl share some money.

Alex gets 46% of the money.

Ben gets half the share that Carl does.

Write the ratio of Alex's share to Ben's share to Carl's share.

Give your answer as a ratio in its simplest form.

.....
(4 marks)

**Calculator**

8 Write the ratio 30 : 18 : 42 in its simplest form.

.....
(2 marks)

9 Judy can make 4 identical tree swings with 98 m of rope.

How many metres of rope will she need to make 5 identical tree swings?

.....m
(3 marks)

10 The ratio of fiction to non-fiction books on a shelf is 8 : 1

There are 63 books in total.

How many fiction books are there?

.....
(2 marks)

11 In a class of 30 students, $\frac{2}{5}$ of the students have a brother.

Write the ratio of students with a brother to those without a brother.

.....
(1 mark)

12 The table shows the forecast and actual weather in a town, each day for almost a month.

	Forecast: some rain	Forecast: no rain
Actual weather: some rain	5	3
Actual weather: no rain	6	11

On what proportion of days was the weather forecast wrong?

Give your answer as a percentage.

.....%
(3 marks)

Overall mark	/30
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NAME

Non-calculator

1 ABC is a triangle.

$$AC = 5 \text{ cm}$$

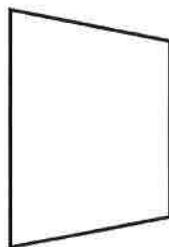
$$BC = 7 \text{ cm}$$

$$\text{Angle } ACB = 100^\circ$$

Make an accurate drawing of triangle ABC .

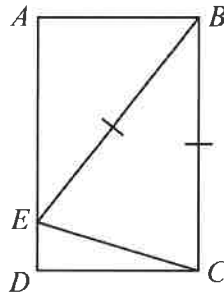
(3 marks)

2 Write down the mathematical name of this quadrilateral.



.....
(1 mark)

3 $ABCD$ is a rectangle.



a Write down two lengths that are equal to BC .

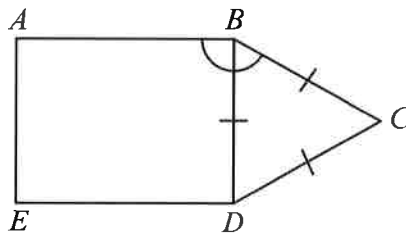
..... and
(2 marks)

b Write down two angles that are equal.

..... and
(1 mark)

4 $ABDE$ is a rectangle.

BCD is an equilateral triangle.

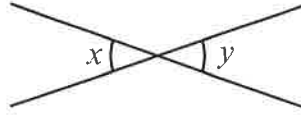


Work out the size of angle ABC .

Give a reason for each step of your working.

.....°
(3 marks)

5 Write down the reason why angle x is equal to angle y .



.....

.....

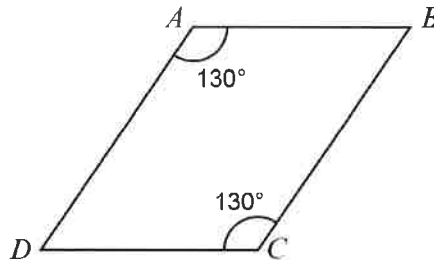
(1 mark)

6 Draw two different sized triangles with angles 20° , 120° and 40° .

(2 marks)

7 $ABCD$ is a rhombus.

The diagonal AC divides the rhombus into two identical triangles.



What type of triangle is triangle ACD ?

.....

(1 mark)

8 a Can a triangle be right-angled and isosceles? Explain.

.....

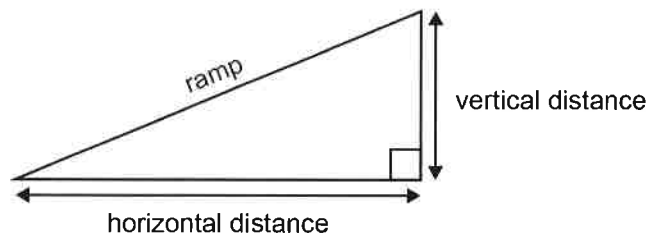
(1 mark)

b Can a triangle be equilateral and right-angled? Explain.

.....

(1 mark)

9 The sketch shows a ramp up a step.



For an electric wheelchair, the ratio horizontal distance : vertical distance is 9 : 1

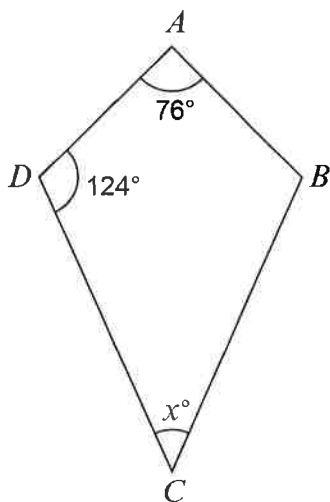
By drawing an accurate diagram, write down the angle between the ramp and the horizontal.

.....°
 (2 marks)



Calculator

10 $ABCD$ is a kite.



Work out the size of angle x .

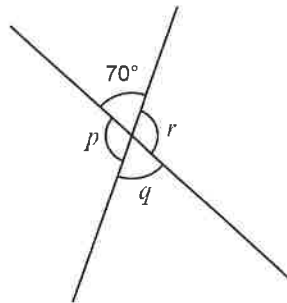
Give a reason for each step of your working.

.....

(2 marks)

11 Work out the sizes of the unknown angles.

Write down a reason for each angle you find.



$p = \dots\dots\dots^\circ$

Reason:

$q = \dots\dots\dots^\circ$

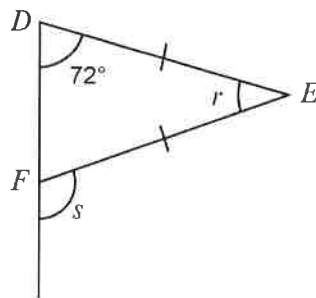
Reason:

$r = \dots\dots\dots^\circ$

Reason:

(3 marks)

12 DEF is an isosceles triangle.



Work out the size of angle r and the size of angle s .

Give reasons.

$r = \dots\dots\dots^\circ$

Reason:

.....

$s = \dots\dots\dots^\circ$

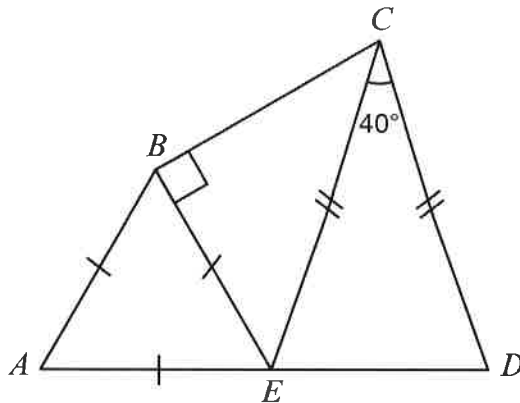
Reason:

.....

(2 marks)

13 Show that angle $BCD = 80^\circ$

Give a reason for each step of your working.



(5 marks)

Overall mark	/30
--------------	-----

NAME

Non-calculator

1 Round 14.667 to 1 decimal place.

.....
(1 mark)

2 Here is a list of numbers.

2 3 8 9 12

From the list write down

a a square number

.....
(1 mark)

b a prime number

.....
(1 mark)

c a multiple of 6

.....
(1 mark)

3 Simplify $3 \times 4s$

.....
(1 mark)

- 4 One football costs £3.54

A football team has £30

Can the team buy 8 footballs?

You must show your working.

.....
(3 marks)

- 5 Expand $5(x + 2)$

.....
(1 mark)

- 6 Work out the missing value.

$$3.2 + \boxed{} = 5.1$$

.....
(2 marks)

7 In a competition Jo gets p points.

a Sam gets 6 points more than Jo.

Write an expression in terms of p for Sam's points.

.....
(1 mark)

b Whitney gets twice as many points as Jo.

Write an expression in terms of p for Whitney's points.

.....
(1 mark)

8 Work out

a $47 - 63$

.....
(1 mark)

b 5×-34

.....
(1 mark)

9 a Here are five number cards.

One number is missing. It is a number from 1 to 10



The range of the numbers on the cards is 8

What is the missing number?

.....
(1 mark)

b Five numbers have a mean of 4

Each of the five numbers is increased by 1

Explain what happens to the value of the mean.

.....
.....
(1 mark)

10 Work out the lowest common multiple of 12 and 20.

.....
(2 marks)

11 a $T = 2b - 7$

Work out the value of T when $b = 5$

.....
(1 mark)

b $P = abc$

Work out the value of P when $a = 3$, $b = 5$ and $c = -4$

.....
(1 mark)

c $R = \frac{3(5 + a)}{4}$

Work out the value of R when $a = 3$

.....
(1 mark)

12 $2.4 \times 1.63 = 3.912$

a Use the above calculation to work out

i 24×1.63

.....
(1 mark)

ii $391.2 \div 2.4$

.....
(1 mark)

b Without doing any calculations, explain why $24 \times 163 \neq 3902$

.....
.....
(1 mark)



Calculator

13 A piece of rope is 4 metres long.

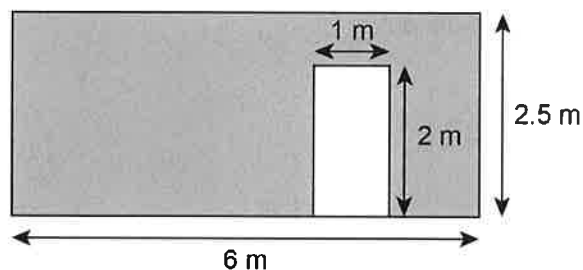
The rope is cut into pieces.

Each piece is 60 cm long.

How much rope is left over?

.....
(3 marks)

14 The diagram shows a rectangular wall with a rectangular door.

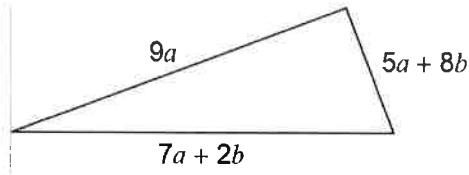


The shaded area is to be painted.

Show that the area of the wall to be painted is 13 m^2 .

(3 marks)

15 Here is a triangle.



Write an expression for the perimeter of this triangle.

Write your answer in its simplest form.

.....
(2 marks)

16 The grouped frequency tables shows some students' heights.

Height (cm)	Frequency
110–119	2
120–129	1
130–139	4
140–149	5
150–159	3

a Lucy writes four more students' heights in the table.

The heights are: 126 cm 132 cm 138 cm 150 cm

Does the modal class change?

Explain your answer.

.....

.....

.....

.....

(2 marks)

- b Explain why the tallest child may not measure 159 cm.

.....

.....

(1 mark)

- 17 A shop sells the same pots of yoghurts in different pack sizes.

Pack A has four pots and costs £2.50

Pack B has six pots and costs £3.70

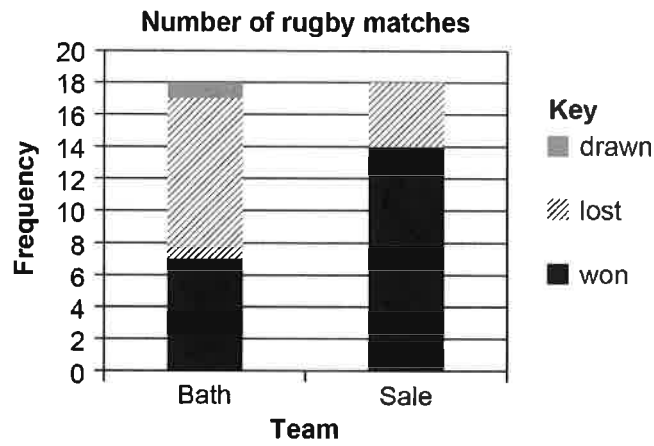
Which pack of yoghurts is better value for money?

You must show all your working.

.....

(2 marks)

18 The compound bar chart shows the number of rugby matches played by Exeter that were won, lost or drawn against two other teams.



Exeter lost more games against Bath than they lost against Sale. How many more games?

.....
(2 marks)

Overall mark	/40
--------------	-----

NAME

Non-calculator

1 Calculate 4% of 1200 mm.

..... mm

(2 marks)

2 Work out 21% of 300

.....

(2 marks)

3 There are 18 sweets in a packet.

8 of the sweets are mint.

What fraction of the sweets are not mint?

Give your answer in its simplest form.

.....

(2 marks)

- 4 The ratio of men to women working for a company is 2 : 3

There are 30 women.

How many men are there?

.....
(2 marks)

- 5 In a game, players pay 50p to roll a dice.

They win £1 if they roll a 6

- a What is the expected number of wins in 30 rolls?

.....
(1 mark)

- b How much profit do you expect the game to make in 30 rolls?

£.....
(2 marks)

- 6 Alice makes porridge from milk and oats.

The ratio of milk to oats is 1 : 2

What proportion of Alice's porridge is milk?

.....
(1 mark)

7 In an art class, the ratio of those who use a pencil to those who use paint is 3 : 7

What percentage of the art class use paint?

..... %

(2 marks)

8 A brass coin is made from 2 grams of tin and 5 grams of copper.

What is the ratio of tin to copper?

.....

(1 mark)

9 Write these fractions in **descending** order.

$$\frac{1}{27} \quad \frac{1}{34} \quad \frac{1}{31}$$

.....

(1 mark)

10 Write < or > in the box to make a correct statement.

$$\frac{23}{7} \quad \square \quad 3 \frac{1}{7}$$

(1 mark)

11 Write 2.048 as a mixed number in its simplest form.

.....
(2 marks)

12 Write the ratio 50 mm : 4 cm in its simplest form.

.....
(2 marks)

13 A Spring festival sells day tickets to weekend tickets in the ratio 11 : 13

A Summer festival sells day tickets to weekend tickets in the ratio 3 : 5

Which festival sells the greater proportion of weekend tickets?

Show working to support your answer.

.....
(3 marks)



Calculator

14 Johan spins a spinner.

He records the colour it lands on.

The frequency table shows his results.

Colour	Frequency	Experimental probability
Red	6	$\frac{6}{20}$
Orange	10	$\frac{10}{20}$
White	4	$\frac{4}{20}$
Total frequency	20	

Amy spins the same spinner.

Here are her results.

Colour	Frequency
Red	8
Orange	15
White	7

- a Explain why Amy and Johan would get more accurate experimental probabilities if they combined their results.

.....

.....

(1 mark)

- b Calculate the more accurate estimate for the experimental probability of landing on red.

.....

(2 marks)

15 Show that only one of these values is greater than 50%.

$$\frac{9}{20}$$

0.49

0.6

(3 marks)

16 A 200 g block of cheese contains 60 g of fat.

How much fat is there in a 500 g block of the same cheese?

.....
(3 marks)

17 The distance from Land's End to John O'Groats is 1400 km.

Jay cycles 210 km from Land's End towards John O'Groats.

What percentage of the distance from Land's End to John O'Groats has he cycled?

..... %

(3 marks)

18 A fair spinner has 20 sections.

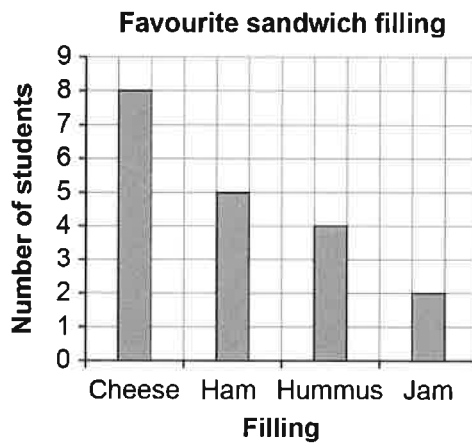
Each section is marked with a number greater than 0

$P(\text{even number}) = 0.7$

How many odd numbers are there on the spinner?

.....
(2 marks)

19 The bar chart shows some students' favourite sandwich fillings.



Work out the probability that one of these students, chosen at random, has a favourite filling of cheese.

.....
(2 marks)

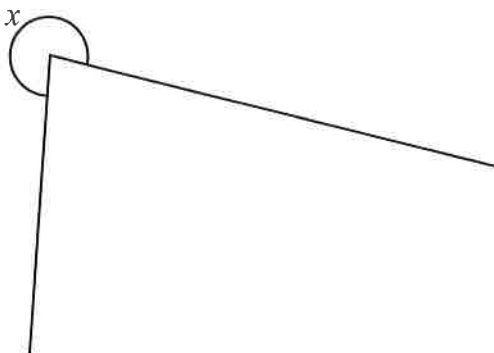
Overall mark	/40
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NAME

Non-calculator

1 Measure the angle marked x .

Give your answer to the nearest degree.



.....°

(1 mark)

2 Make an accurate drawing of triangle XYZ, with

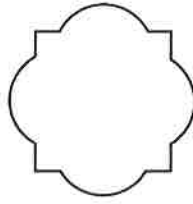
Angle XYZ = 50°

Angle XZY = 60°

YZ = 6 cm

(3 marks)

3 Draw all the lines of symmetry on this shape.



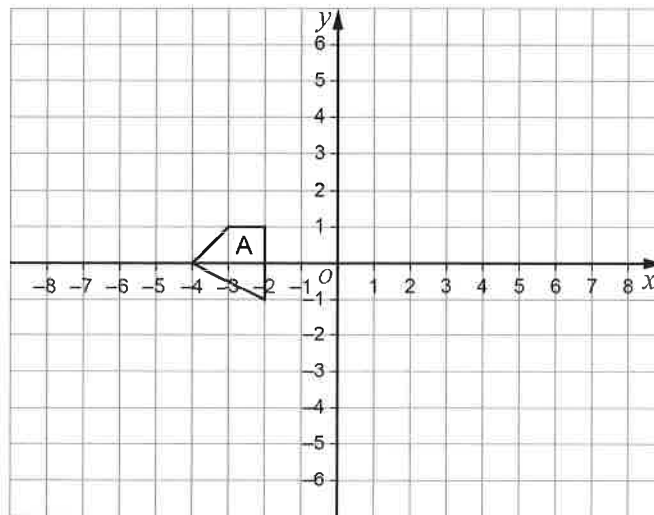
(2 marks)

4 Work out the n th term of this sequence.

-6, -5, -4, -3, -2, ...

.....
(1 mark)

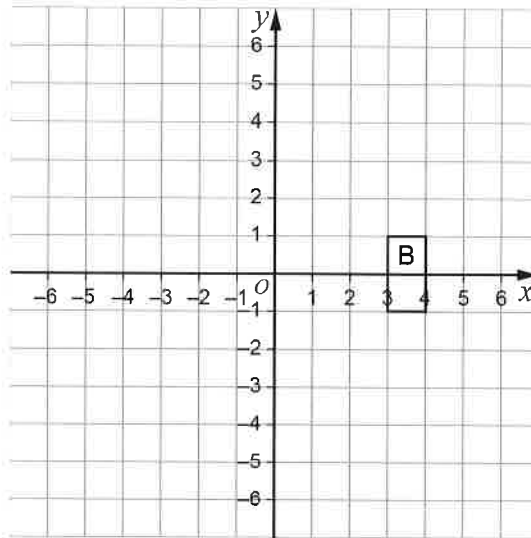
5 Reflect shape A in the line $y = 2$



(2 marks)

6 Fred rotates an object A, 90° anticlockwise, about the point (4, 4).

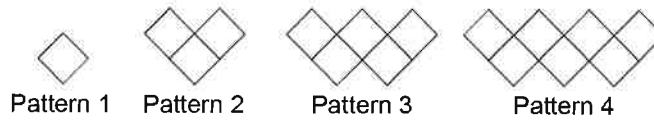
The rectangle B is the image.



Draw the object A that Fred rotated.

(2 marks)

7 Here is a pattern sequence.



a Describe how the sequence continues.

.....

.....

(1 mark)

b How many squares will there be in Pattern 6?

.....

(1 mark)

8 Explain why this statement is true:

'An equilateral triangle is an isosceles triangle.'

.....

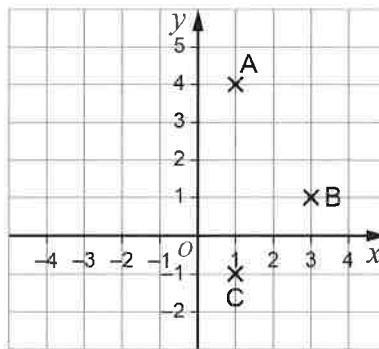
.....

.....

.....

(2 marks)

9 Points A, B and C are three vertices of kite ABCD.



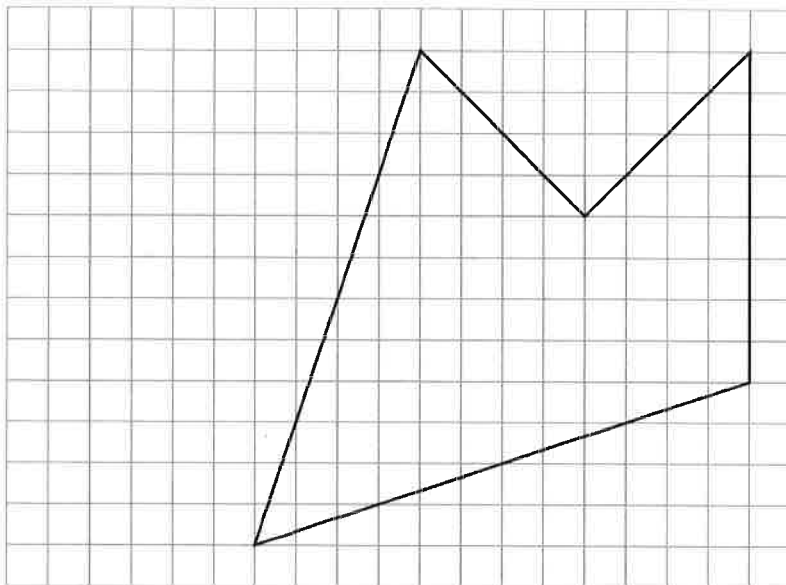
Write down the coordinates of vertex D.

(.....,)

(1 mark)

10 Nicola enlarges an object by scale factor 4.

This is the image.



Draw the object that Nicola enlarged.

(2 marks)

11 Ali draws a vertical line on a grid.

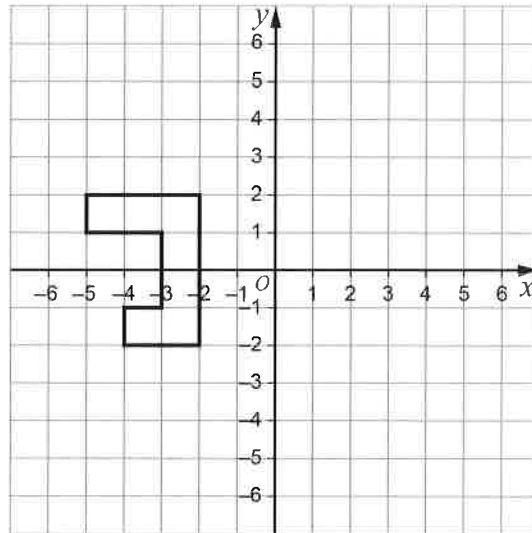
He says,

'My vertical line crosses the graph $y = x$ at the point (2, 2).'

What is the equation of Ali's vertical line?

.....
(1 mark)

12 When this shape is rotated 180° about $(-3, 0)$, the image is the same as when it is transformed using a reflection followed by another reflection.



Write down the two lines that the shape is reflected in.

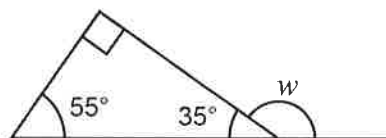
.....

(2 marks)



Calculator

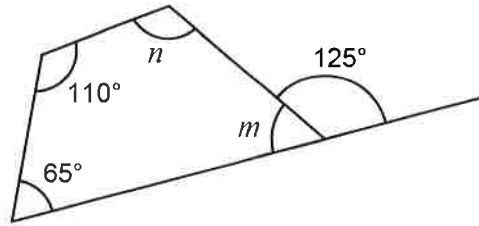
13 Work out the size of the angle marked w .



.....°

(1 mark)

14 Work out the size of the angle marked m and the size of the angle marked n .



Give a reason for each of your answers.

$m = \dots\dots\dots^\circ$

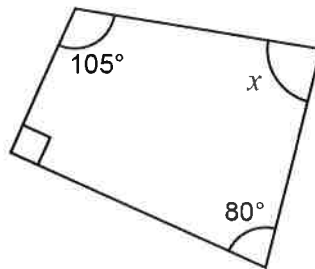
Reason: $\dots\dots\dots$

$n = \dots\dots\dots^\circ$

Reason: $\dots\dots\dots$

(4 marks)

15 Tara is trying to work out the size of the angle marked x in this quadrilateral.



$x = 180 - 105 - 90 - 80 = -95$

What mistake has she made?

$\dots\dots\dots$
 $\dots\dots\dots$

(1 mark)

16 Samira starts the week with £21 in coins.

She uses the coins to pay £3.50 each day for parking.

a Work out the amount Samira has at the end of days 1, 2 and 3.

Day 1: £.....

Day 2: £.....

Day 3: £.....

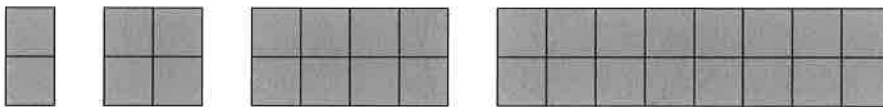
(2 marks)

b When does Samira run out of money?

At the end of day

(1 mark)

17 Here is a sequence of growing rectangles.



a Ashley says, 'The sequence grows by adding 2 squares each time.'

Is Ashley correct? Explain your answer.

.....

.....

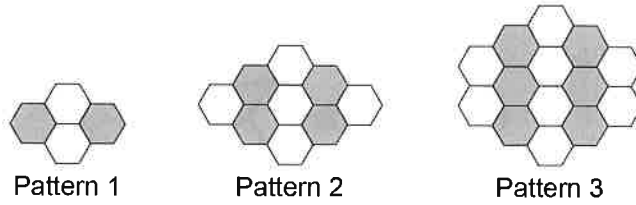
(1 mark)

b Find the number of squares in the 5th rectangle in the sequence.

.....

(1 mark)

18 Here is a pattern sequence.

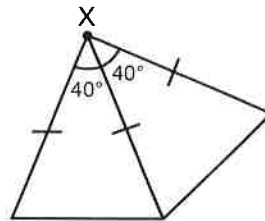


Pattern P is in this sequence and has 29 hexagons.

How many of the hexagons in pattern P are white?

.....
(2 marks)

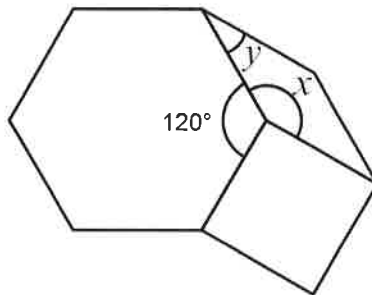
19 Lily joins identical isosceles triangles together around point X like this, to make a polygon.



What is the total number of identical isosceles triangles that will fit together around point X?

.....
(2 marks)

20 The diagram shows a regular hexagon, a square and a rhombus.



Work out the size of angle x and the size of angle y in the rhombus.

Give a reason for each of your answers.

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

Reason:

$y = \dots\dots\dots^\circ$

Reason:

(4 marks)

Overall mark	/40
--------------	-----