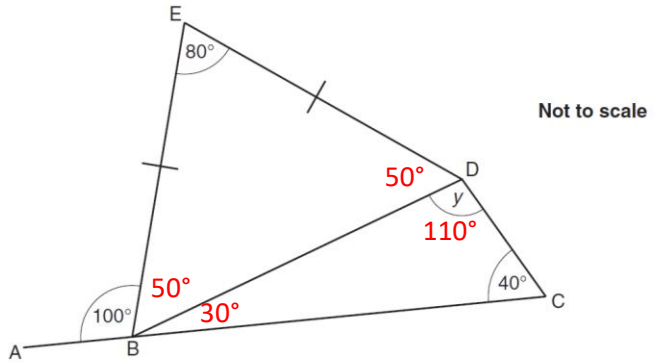
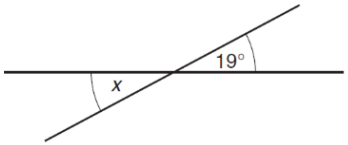
In the diagram ABC is a straight line.
BE = ED.

Work out angle *y*.
Show all your working.



Not to scale

Complete the sentence below.



Not to scale

Angle *x* is 19° ..... ° because Vertically opposite .....

..... [2]

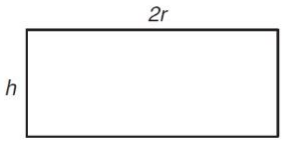
$\frac{x}{3} + 25 = 29$

$\frac{x}{3} = 4$

$x = 12$

(iii) *x* = ... **[2]**

The grill of Robert's barbecue is a rectangle.



Not to scale

Write a formula for the perimeter, *P*, of the grill.

P = 2r + h + 2r +h

P = 4r + 2h

(b) ..... **[2]**

Write down the reciprocal of 5.

$\frac{1}{5}$

(a) ..... [1]

Write 450 as a product of its prime factors.

$2 \times 3^2 \times 5^2$

The expression for the nth term for a different sequence is $5n + 2$.

Write down the first three terms of this sequence.

5x1 +2 5x2 +2 5x3 +2

7 12 17

(b) .... [2]

Here are the first four terms of another sequence.

2 5 8 11

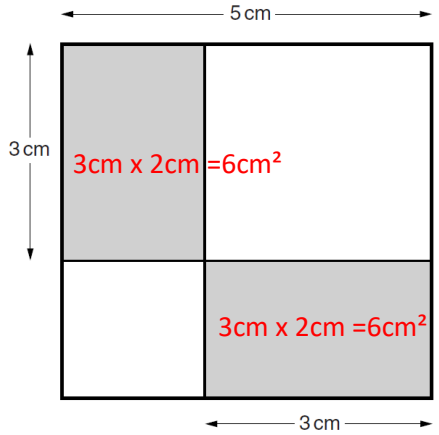
Write down an expression for the nth term.

3n - 1

(c) ..... [2]

C

This shape is a square with two shaded rectangles.



Not to scale

What fraction of the shape is shaded?

5cm x 5cm =25cm²

$\frac{12}{25}$

A garden centre buys 72 plants.
The plants cost £3.94 each.

70 x £4 = £280

Estimate the total cost of the plants.
Show how you get your answer.

Factorise fully.

$4p^2 - 8p$

4p (p – 2)

(c) _____ **[2]**

Catalin works in an office.
One week he divides his time between these tasks:

- $\frac{1}{4}$ of his time in meetings
- $\frac{5}{8}$ of his time writing reports
- the rest of his time doing the accounts.

$\frac{1}{4} + \frac{5}{8} = \frac{7}{8}$

$\frac{1}{8}$ = 6hours

He spends a total of 6 hours doing the accounts.

$\frac{8}{8}$ = 48hours

Find the total number of hours he works in the week.

Glyn, Mark and Clare are making bread rolls.
This is the list of ingredients for their recipe.

Ingredients to make **12** bread rolls	
350 g	flour
20 g	butter
230 ml	water
2 teaspoons	yeast
1 teaspoon	salt

(a) Glyn is going to make 36 bread rolls.

How many teaspoons of yeast will he need?

12 : 2 (x3) → 36 : 6

(a) _____ **[1]**

(b) Mark is going to make 30 bread rolls.

How much flour will he need?

12 : 350 (x2.5) → 30 : 875

Complete this table of equivalent fractions, decimals and percentages.

Fraction		Decimal		Percentage
$\frac{1}{2}$	=	0.5	=	50%
$\frac{3}{4}$	=	0.75	=	75%
$\frac{97}{100}$	=	0.97	=	97%
$\frac{3}{100}$	=	0.03	=	3%

[4]

Work out, giving your answer as a fraction.

(i) $\frac{1}{2} + \frac{1}{4}$ $\frac{2}{4} + \frac{1}{4} = \frac{3}{4}$

John changes some money.
For every £1 that he changes, he receives 1.12 euros.
John changes £300.

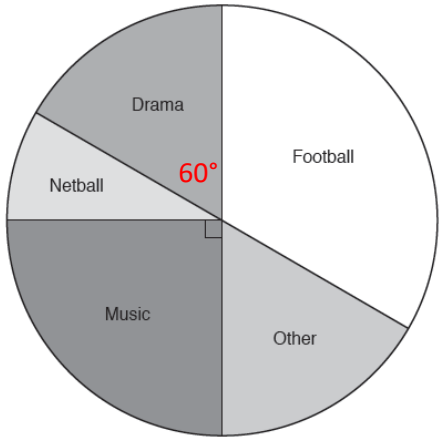
How many euros does he receive?

300 x 1.12

= 336

(c) _____ euros **[2]**

48 students were asked which is their favourite leisure activity.
The results are recorded in this pie chart.



(a) Which leisure activity is the mode?

football

(a) _____ **[1]**

(b) How many students said Music?

$\frac{90}{360}$ x 48 = 12

(b) _____ **[2]**

(c) How many students said Drama?

$\frac{60}{360}$ x 48 = 8

(b) The table below summarises the lengths of Kyle's phone calls during the month.

Length of call (t minutes)	Frequency	midpoint	Mid x f
$0 < t \leq 2$	19	1	19
$2 < t \leq 4$	12	3	36
$4 < t \leq 6$	8	5	40
$6 < t \leq 8$	7	7	49
$8 < t \leq 10$	4	9	36
	50		180

Calculate an estimate of the mean length of a call.

180 ÷ 50 = 3.6

(b) _____ minutes **[4]**

C

19 Rick asked a random sample of 160 students from his school what they did for lunch.
The table shows the results of Rick's survey.

School lunch	Packed lunch	Go to shops	No lunch
43	61	38	18

(a) Work out the relative frequency of eating school lunch.

$\frac{43}{160}$ = 0.26875

(a) _____ **[1]**

(b) There are 1200 students in the school.

Estimate the number of students in the school who go to the shops for their lunch.

$\frac{38}{160}$ = 0.2375

0.2375 x 1200 = 285

(b) _____ **[2]**

Rearrange this formula to make *t* the subject.

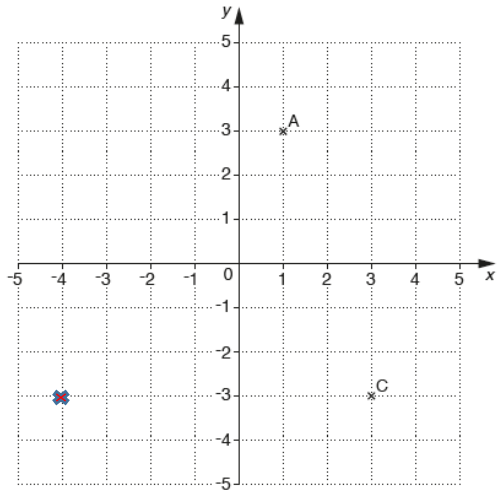
$v = 5t + 20$

v – 20 = 5t

$\frac{v-20}{5}$ = t or $\frac{v}{5}$ - 4 = t

5

Points A and C are plotted on a coordinate grid.



(a) Write down the coordinates of point A.

1 3

(a) (..... , ...) **[1]**

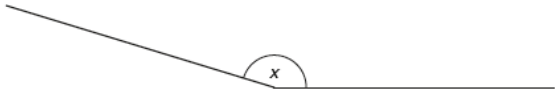
(b) On the grid, plot point B at (-4, -3). **[1]**

(c) What is the mathematical name of triangle ABC?

Scalene

(c) ..... **[1]**

(a) Measure the size of angle *x*.



162°

(a) ..... ° **[1]**

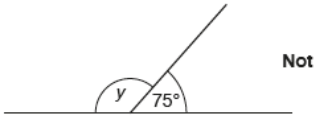
(b) What is the mathematical name of this type of angle?

Obtuse

(b) ..... **[1]**

(c) Work out the angles below. Give a reason for each answer.

(i)



Not to scale

Angle *y* is 105° because Angles on a straight line = 180°

..... **[2]**

(b) A square and a rectangle are drawn below.

Not to scale

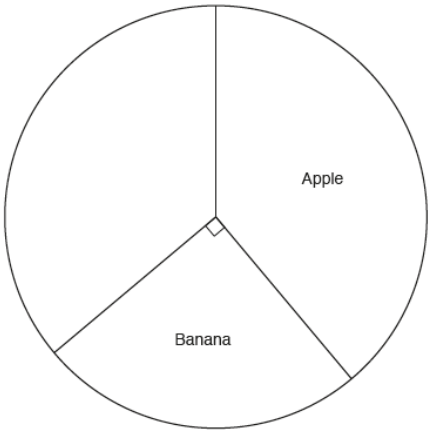
The width, *w* cm, of the rectangle is the same as the length of a side of the square.

Work out the area of the rectangle.

48cm²

(b) ..... cm^2 **[3]**

Jim asked 180 people to name their favourite fruit.
He started to draw a pie chart to show the results.



Here are the rest of Jim's results.

Favourite fruit	Number of people
Pear	16
Grapes	30
Other	19

$\frac{16}{180} \times 360 = 32°$

$\frac{30}{180} \times 360 = 60°$

$\frac{19}{180} \times 360 = 38°$

(a) Complete the pie chart.

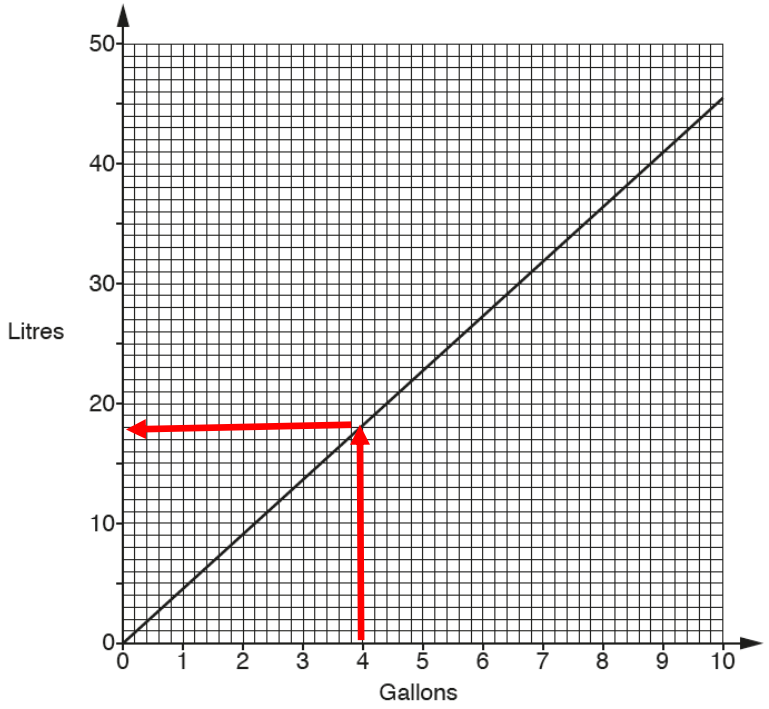
[3]

(b) How many people chose Banana as their favourite fruit?

$\frac{90}{360} \times 180 = 45$

(b) ..... **[1]**

This is a conversion graph between gallons and litres.



(a) Use the graph to convert 4 gallons into litres.

18

(a) ..... litres **[1]**

C

What is the order of rotation symmetry of each of these shapes?

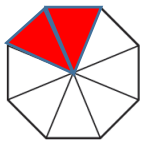
4

2

[2]

(a) Shade $\frac{1}{4}$ of this shape.

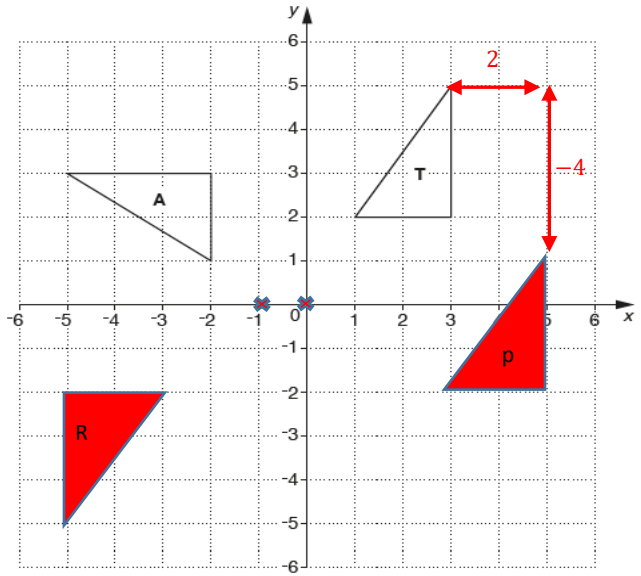
$\frac{1}{4} = \frac{2}{8}$



[1]

17

The diagram shows two triangles on a square grid.



(a) Translate triangle **T** by the vector $\begin{pmatrix} 2 \\ -4 \end{pmatrix}$.

Label the image **P**. **[2]**

(b) Rotate triangle **T** through 180° about centre (-1, 0).

Label the image **R**. **[2]**

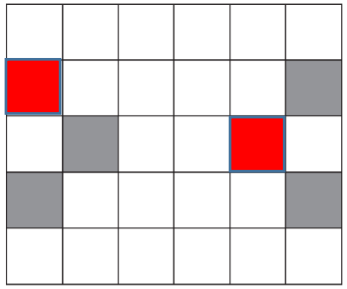
(c) Describe the **single** transformation that maps triangle **T** onto triangle **A**.

Rotation 90° anti clockwise about the origin

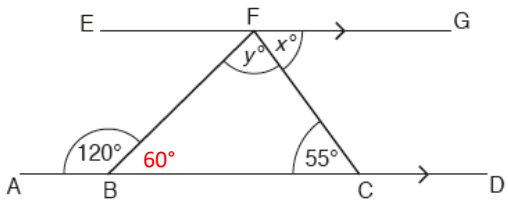
..... **[3]**

69m

Shade **2 more** small squares on this shape so that it has 2 lines of reflection symmetry.



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



Not to scale

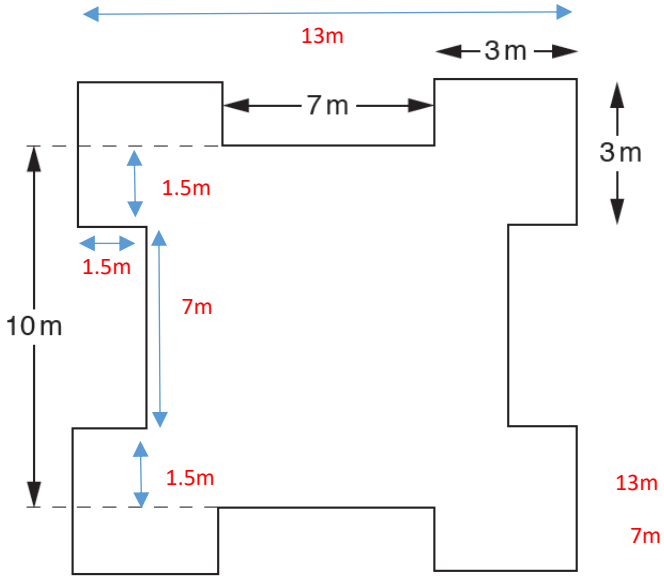
C

(i) Complete the sentence with a reason.

$x = 55°$ because *alternative angles are equal* ..... **[1]**

(ii) Work out y. 180° - 55° - 60° = 65°

The diagram shows the plan of a castle.
The plan has four lines of symmetry.



Not to scale

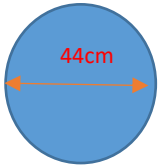
13m x 13m = 169m²

7m x 1.5m = 10.5m²

Work out the area of the plan. 169m – (4 x 10.5m²) = 127m²

A water tank is in the shape of a cylinder.
It has diameter 0.44 m and height 1.2 m.
Water flows into the tank at a rate of 20 litres per minute.
1 litre = 1000 cm^3.

John says that it will take about 10 minutes to completely fill the empty tank.
Is he correct? Show calculations to justify your answer. [5]



Area = ∏r^2

Area = 3.14 x 22^2

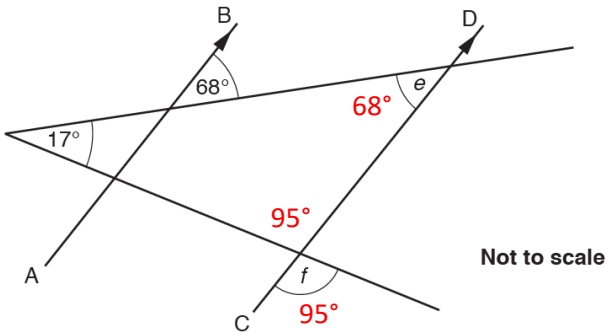
Area = 1519.76cm^2

1,519.76cm^2 x 120cm = 182,371.2cm^2

182,371.2cm^2 ÷ 1,000 = 182.37 litres

182.37 litres ÷ 20 = 9.12 minutes

In the diagram AB is parallel to CD.



Not to scale

Work out the following angles, giving reasons for each answer.

(i) Angle e = 68° because Alternate angles are equal [1]

(ii) Angle f = 95° because Angles in a triangle add up to 180° and vertically opposite [3]

C

Amy is making some shelves for her bedroom.

kilograms	metres	millimetres	kilometres
litres	milligrams	grams	millilitres

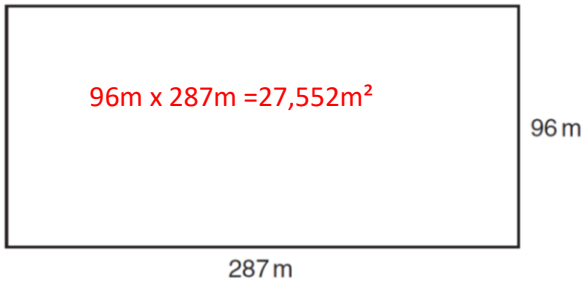
Complete her shopping list, using words from the box above.

Wood for shelves of length 3.5 Metres .

A tin of paint containing 1.5 Litres .

A bag of screws weighing 100 Grams . [3]

Courtney owns a field.
The field is a rectangle with length 287 m and width 96 m.



Courtney needs to find the area of the field in hectares.
One hectare is 10 000 m^2.

27,552m^2 ÷ 10,000 = 2.7552 hectares

Work out the area of the field in hectares.
Give your answer correct to 1 decimal place. = 2.8 hectares