At Rumblestone Station northbound trains stop every 20 minutes and southbound trains stop every 16 minutes.
Two trains stopped together at the station at 1500.

Work out the next time when two trains will stop together at this station.

Northbound = 20, 40, 60, 80

80 minutes = 1hour 20mins

Southbound = 16, 32, 48, 64, 80

15:00 + 1 hr 20mins = 16:20

Bill is going on a journey.
His van goes 15 miles per gallon of petrol.
Petrol costs £1.37 per litre.

1 gallon is 4.5 litres.

How much will the petrol cost for a journey of 360 miles?

360 miles ÷ 15 = 24 gallons

4.5 x 24 = 108 litres

108 x 1.37 = £147.96

Rashid carried out a survey outside a polling station.
He asked 500 voters how they travelled to the polling station.
His results are shown in the table below.

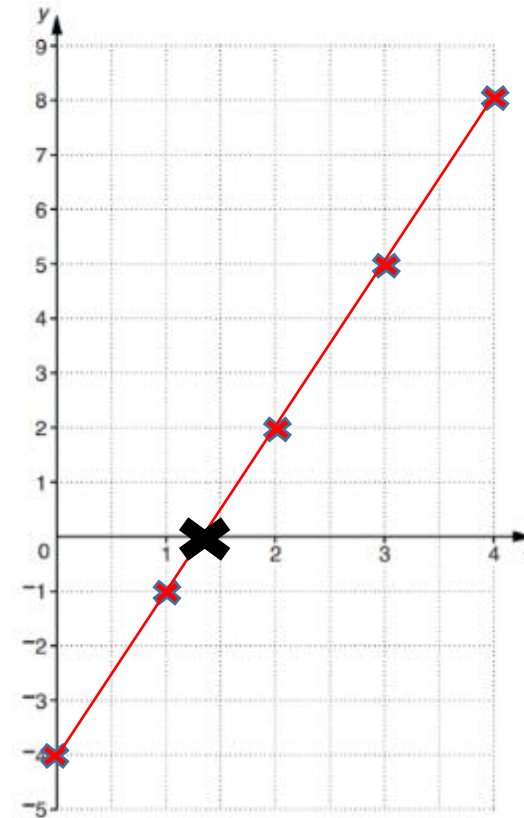| Method of travel	Bus	Walk	Motorbike	Car	Cycle	Taxi
Frequency	116	168	33	156	15	12

Use these results to estimate the probability that the next person asked cycled to the polling station.

$$\frac{15}{500} = \frac{3}{100} \quad \text{or} \quad 0.03 \quad \text{or} \quad 3\%$$

(a) Complete this table for $y = 3x - 4$.

x	0	1	2	3	4
y	-4	−1	2	5	8

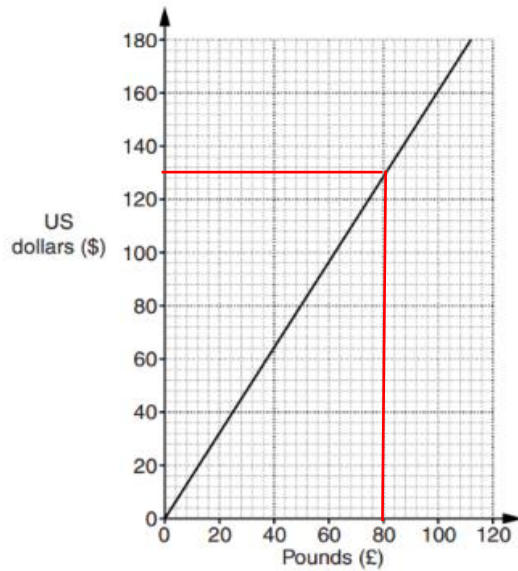**(b)** Plot these points on the grid and draw the graph of $y = 3x - 4$.

(c) On your graph put a cross (✗) at the point where $3x - 4 = 0$.

$Y = 3x - 4$

$Y = 3 \times 0 - 4$

$Y = 0 - 4$

$Y = -4$

$Y = 3x - 4$

$Y = 3 \times 2 - 4$

$Y = 6 - 4$

$Y = 2$

In the USA Luke needs some more dollars.
This conversion graph shows the exchange rate he gets now.

(i) Luke changes £80 into US dollars.

Use the graph to find how many dollars he gets. $130

Enlarge the shape below with a scale factor of 3.
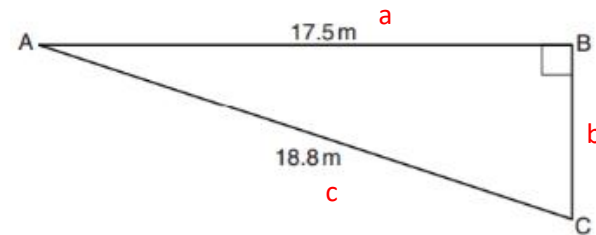The bottom line has been drawn for you.

Mrs Henley is going to the polling station to vote.
She can walk (W), go by bus (B) or by taxi (T).
There are 9 ways Mrs Henley could travel to and from the polling station.

Complete the list.

To the polling station	From the polling station
B	T
B	B
B	W
W	T
W	B
W	W
T	T
T	B
T	W

ABC is a right-angled triangle.

Calculate BC.
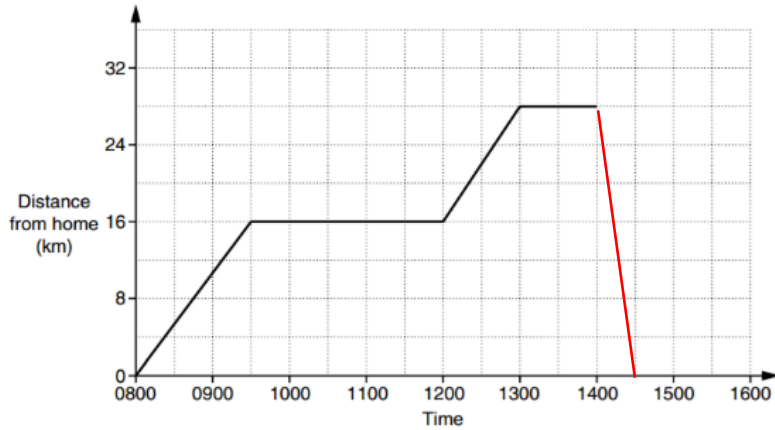Give your answer correct to 2 decimal places.

$a^2 + b^2 = c^2$

$17.5^2 + b^2 = 18.8^2$

$306.25 + b^2 = 353.44$

$b^2 = 47.19$

$b = 6.87$

(d) Sylvia went by bus to Elwood to go shopping.
After shopping she went to visit a friend.
The graph shows her journey.

(i) How long did Sylvia spend shopping?

2 and a half

(d)(i) _____ hours [1]

(ii) How far was Sylvia from home at 1300?

28

(ii) _____ km [1]

(iii) Sylvia leaves her friend's house at 1400 and arrives home 30 minutes later.

Show this journey on the graph. [1]

One morning Sam records the number of people in each car passing his house.
Here are his results.

Number of people in a car	Frequency	f x χ
1	26	26
2	38	76
3	24	72
4	16	64
5	8	40
	112	278

Calculate the mean number of people in the cars passing Sam's house.

278 ÷ 112 = 2.482

Jenny is a javelin thrower.
Here is a summary of the lengths of 40 of Jenny's throws this year.

Length of throw (s metres)	Frequency	midpoint	mp x f
$40 \leqslant s < 46$	4	43	172
$46 \leqslant s < 52$	12	49	588
$52 \leqslant s < 58$	19	55	1,045
$58 \leqslant s < 64$	5	61	305
	40		2,110

Calculate an estimate of the mean length of her javelin throws.

2,110 ÷ 40 = 52.75

Circumference

πd

3.14 x 65.5 cm = 205.67 cm

205.67 x 3509 =
721,696.03 cm

= 7,216.9603m

= 7.2169603 km

Parvinder has a bicycle.
Each wheel has a diameter of 65.5 cm.

65.5 cm
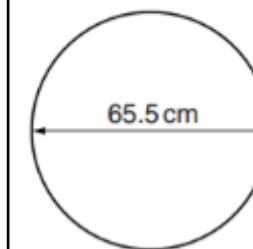
On one journey each wheel rotated 3509 times.

Calculate the distance Parvinder cycled.
Give your answer in kilometres.

Here is a quadrilateral.

$3x + 20$

Not to scale

x

$6x$

A $2x$

(a) Explain why angle A in the quadrilateral is $180 - 2x$.

Angles on straight line add to 180°

(b) Work out the size of the angle marked x.
Show all your working.

$x + 6x + 3x + 20 + 180 - 2x = 360°$

$8x + 200 = 360°$

$8x = 160°$

$X = 20°$

Work out the area of this triangle.

3.2 cm

4.6 cm

$\frac{1}{2}bh$

$\frac{1}{2}$ x 4.6 x 3.2 = 7.36cm²

Work out the area of this trapezium.
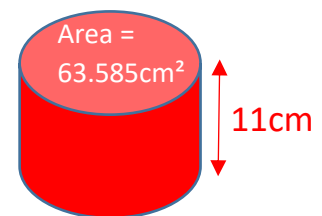
9 cm

5 cm

Not to scale

12 cm

$\frac{a+b}{2}$ h =

$\frac{9+12}{2}$ × 5 = 52.5 cm²

Jo has 22 litres of hot chocolate to pour into mugs.
The mugs are cylinders with an internal diameter of 9 cm and an internal height of 12 cm.
Each mug is filled to 1 cm from the top.

How many mugs can Jo fill?

9 cm

12 cm

9cm

πr^2

3.14 x 4.5² = 63.585cm²

Area =
63.585cm²

11cm

$Volume =$ 63.585cm^2 x 11cm = 699.435cm³

22litres x 1,000 = 22,000cm³

22,000cm³ ÷ 699.435cm³ = 31.4 or 31 mugs

Write down an expression for the perimeter of this shape.
Give your answer in its simplest form.

$2x$

Not to scale

x

$4x$

$X + y$

y

$6x$

$2x + x + 4x + y + 6x + x + y$

Simplifies to: $14x + 2y$

The scale drawing shows a garden ABCD.

Scale: 1 cm represents 2 m

A   B

9m (orange region)

D   C
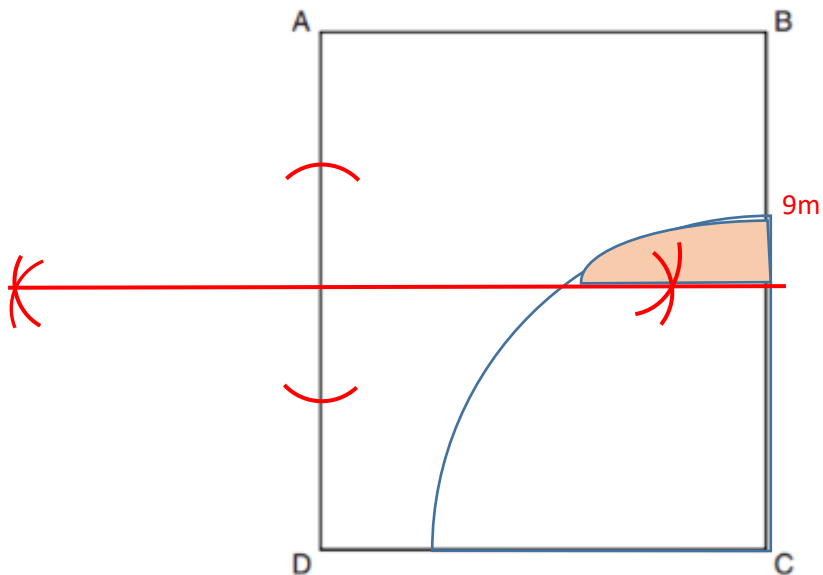
Anna will plant a tree in the garden.

The tree must be

- closer to A than to D
- less than 9 m from C.

Construct and shade the region where Anna can plant the tree.
Leave in all your construction lines.
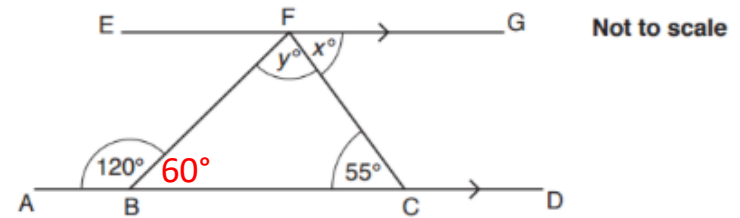
Rearrange this formula to make r the subject.

$$p = 3r - 7$$

P = 3r -7

P + 7 = 3r

$\frac{p+7}{3}$ = r

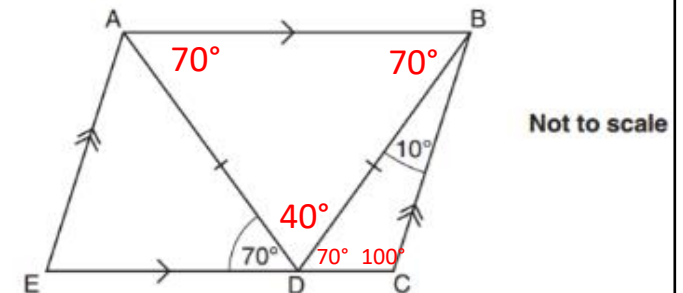In the diagram, ABCD is parallel to EFG.
Angle BCF = 55° and angle ABF = 120°.

E ———————— F ———— G   **Not to scale**

$y°$ $x°$

120° 60°   55°

A   B   C   D

(i) Complete the sentence with a reason.

x = 55° because ......Alternate angles are equal.. [1]

(ii) Work out y.

180° - 55° - 60° = 65°

The diagram shows parallelogram ABCE.
D is a point on EC.
AD = BD, angle ADE = 70° and angle CBD = 10°.

A   B

70°   70°

10°   **Not to scale**

40°

70° 70° 100°

E   D   C

Work out angle BCD.
Give a reason for each angle you work out.

Angle BAC = 70° because alternate to angle EDA
Angle ABC = Angle DAB (two angles in isosceles are equal)
Angles in a triangle = 180° - 70° - 70° = 40°
Angles on a straight line = 180° - 70° - 40° = 70°
Angles in a triangle = 180° - 10° - 70° = 100°

Jo records the marks for three pieces of coursework.
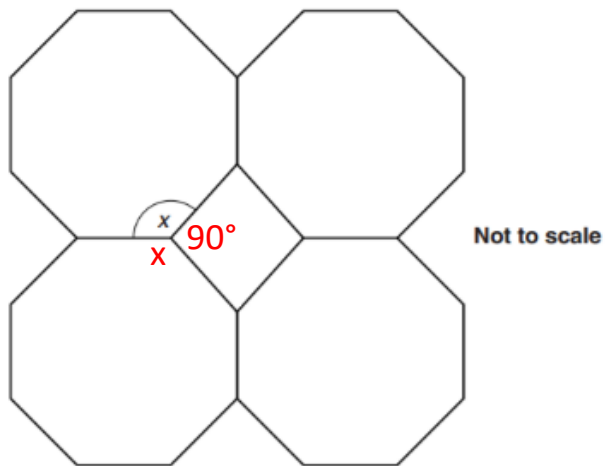The marks on her work are shown below.

$$\frac{13}{50} \qquad \frac{9}{40} \qquad 22\%$$

Write her marks in order of size, starting with the lowest.
Show how you decide.

$\frac{13}{50} = 0.26 \qquad \frac{9}{40} = 0.225 \qquad 22\% = 0.22$

$22\% \qquad \frac{9}{40} \qquad \frac{13}{50}$

This sketch shows four identical regular octagons and a square.

Not to scale

Work out angle x.
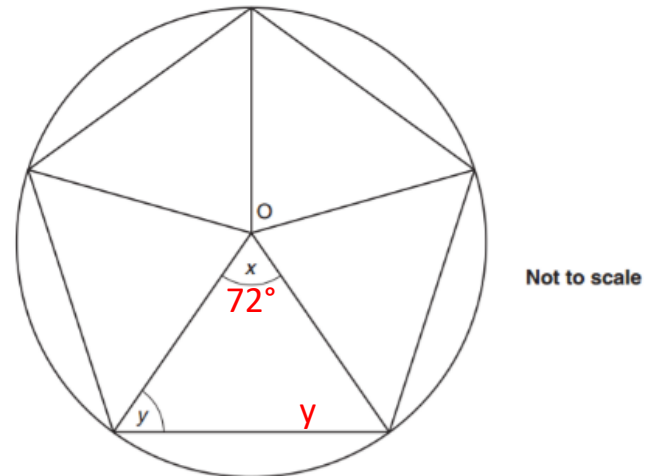Give a reason for each step of your working.

$x + x + 90° = 360$

$2x + 90° = 360°$

$2x = 270°$

$x = 135°$

This diagram represents a regular pentagon with its vertices on the circumference of a circle, centre O.

Not to scale

(a) Work out angle x.

$360° \div 5 = 72°$

(a) ....° [2]

(b) Work out angle y.

$2y + 72° = 180°$

$2y = 108°$

$y = 54°$

Five whole numbers have the following properties:

- the range is 9
- the largest number is 11
- the mode is 8
- the mean is 7.

What are the five numbers?

2, 6, 8, 8, 11