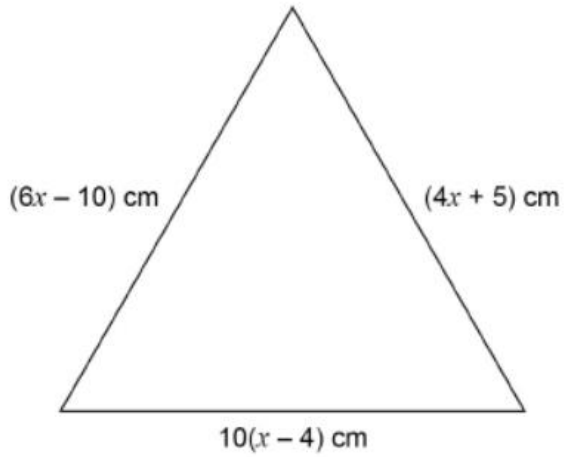
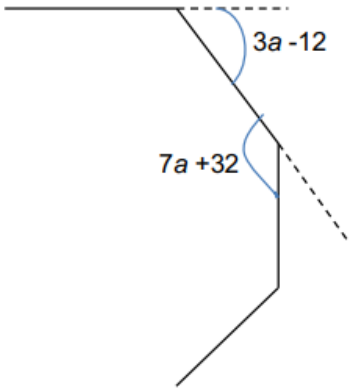
This triangle is **equilateral**.



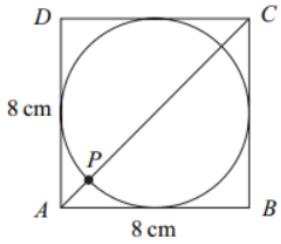
Is the perimeter of the triangle greater than one metre?

You **must** show your working.

The diagram below shows part of a regular polygon.
Determine how many sides the polygon has.



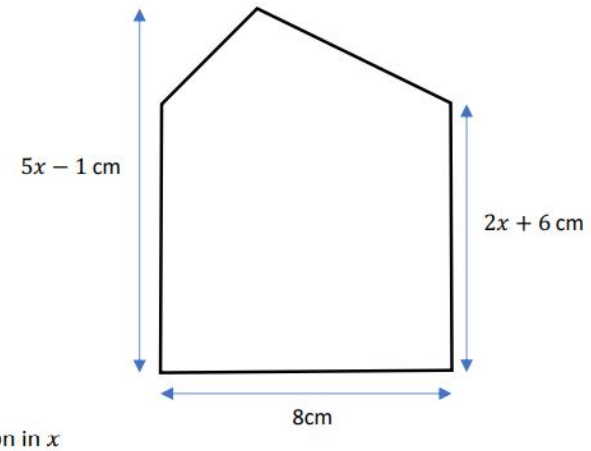
The diagram below shows a square with an inscribed circle of radius 4cm



Show that the length AP = 1.66cm to 3 significant figures

(3 Marks)

6) The shape below has an area of 90 cm^2



a) Form an equation in x

b) Solve this equation to find x

(5 Marks)

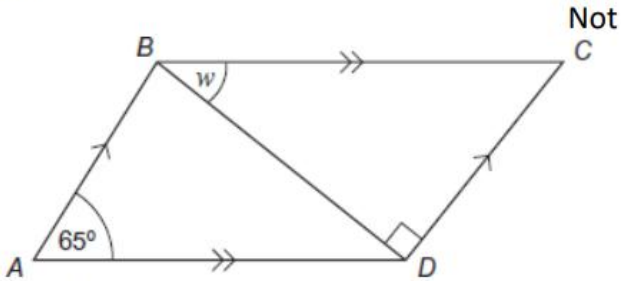
7) Prove algebraically that $0.7\dot{3} = \frac{11}{15}$

Here are two piles of the same type of paper. Each sheet of paper is $\frac{7}{1000}$ cm thick.
The taller pile is $10\frac{1}{2}$ cm high.

height of taller pile : height of smaller pile = 3 : 2

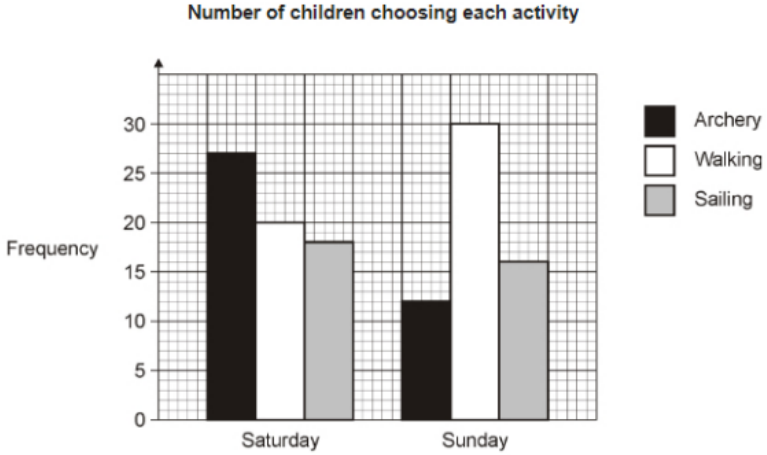
Work out the number of sheets in the shorter pile.

ABCD is a parallelogram.
BD is a diagonal.



Work out the size of angle *w*.

Q17. An outdoor centre has activities for children.



(a) Adults help with **walking** in the ratio

number of adults : number of children = 1 : 5

3 adults can help with walking on **Saturday**.

Is this enough?

You **must** show your working.

(b) A group of people go **sailing** in the ratio

number of adults : number of children = 1 : 2

What fraction of the group are adults?

(c) On **Sunday** all the children do the activity they choose.

The ratios for each activity are shown in the table.

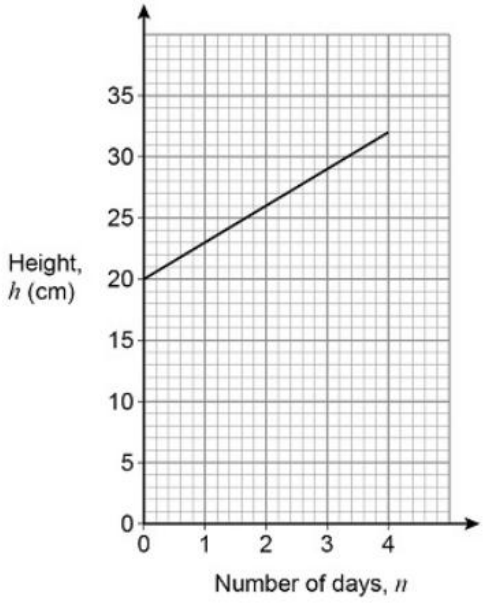
Activity	Number of adults : number of children
Archery	1 : 3
Walking	1 : 5
Sailing	1 : 2

Work out the total number of adults needed for Sunday.**(3)**

Jim buys a plant of height 20 cm

The graph shows how the height of the plant changes during the next 4 days.

Work out a formula for h in terms of n.



To the nearest 1000, there are 18 000 people at a festival.

(a) Write down the minimum possible number of people at the festival.

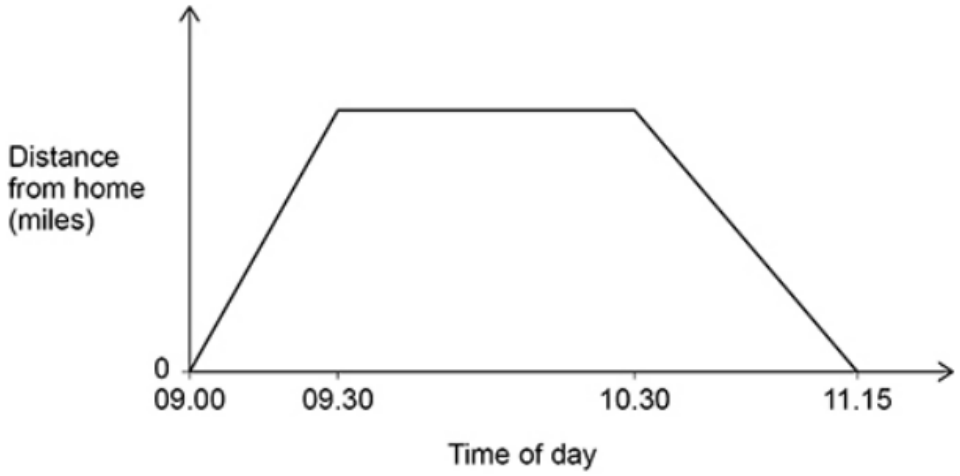
(1)

(b) Write down the maximum possible number of people at the festival.

(1)

(Total 2 marks)

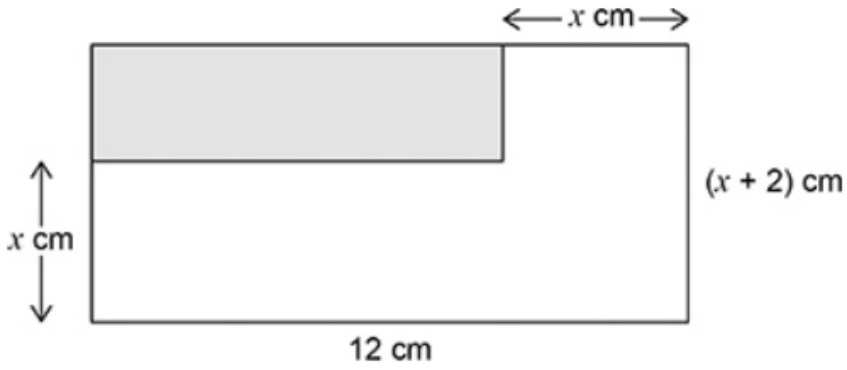
14) Chris visits a library. He cycles to the library in half an hour at a speed of 12 miles per hour. He stays at the library for one hour. He then cycles home. The sketch graph represents his visit.



Work out the speed, in miles per hour, at which Chris cycles home. **(Total 3 marks)**

Here are two rectangles.

Not drawn accurately



The area of the shaded rectangle is $\frac{1}{4}$ the area of the large rectangle.

Work out the value of x.

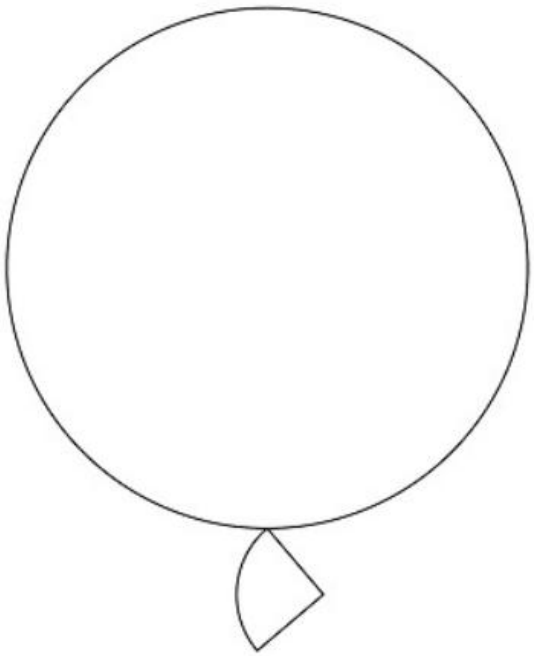
Two wire shapes make an earring.

The shapes are

a circle with radius 21 mm

and

a quarter circle.



radius of circle : radius of quarter circle = 7 : 2

(a) Show that the radius of the quarter circle is 6 mm

(1)

(b) Work out the **total** length of the wire in the earring.

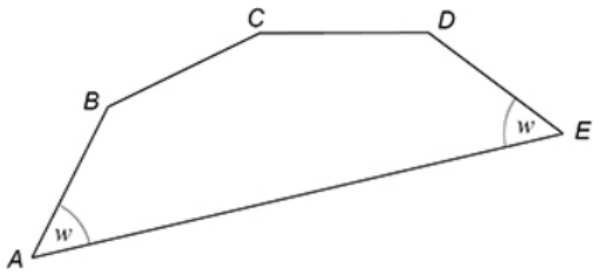
Give your answer in the form $a\pi + b$ where a and b are integers.

(4)

(Total 5 marks)

12) *AB*, *BC*, *CD* and *DE* are four of the sides of a **regular 10 sided shape**.

Not drawn accurately

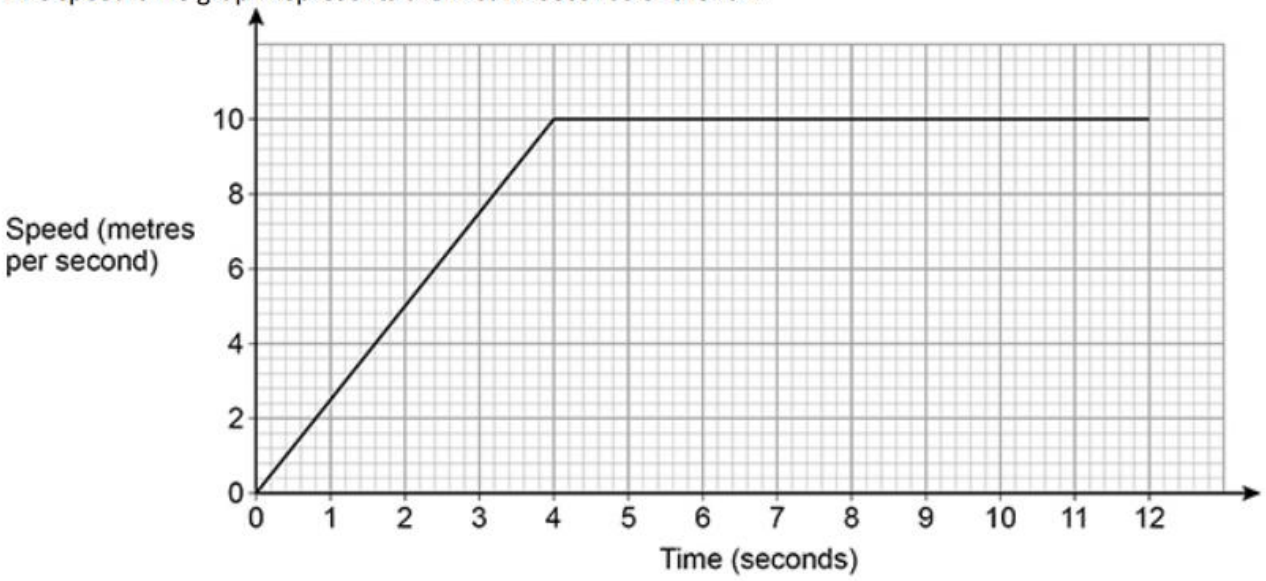


Work out the size of angle *w*.

(Total 3 marks)

15) A horse runs in a field.

The speed-time graph represents the first 12 seconds of the run.



After how many seconds had the horse run a distance of 70 metres?

(Total 3 marks)

16) A marathon takes place each year.

In 2020 there were 6500 runners.

Prediction
For each of the next 3 years the number of runners will increase by 5%

Does this predict that in 2023 there will be more than 7500 runners?

You **must** show your working.

(Total 3 marks)

A rectangle has an area of $125cm^2$ with its side lengths in the ratio 4:5

Find the perimeter of the rectangle