10 Solve the simultaneous equations

$$3x + 5y = 3.1$$
$$6x + 3y = 3.75$$

Show clear algebraic working.

$x =$ ....

$y =$ ....

(Total for Question 10 is 3 marks)

11 The diagram shows a regular 10-sided polygon, *ABCDEFGHIJ*

Diagram **NOT** accurately drawn
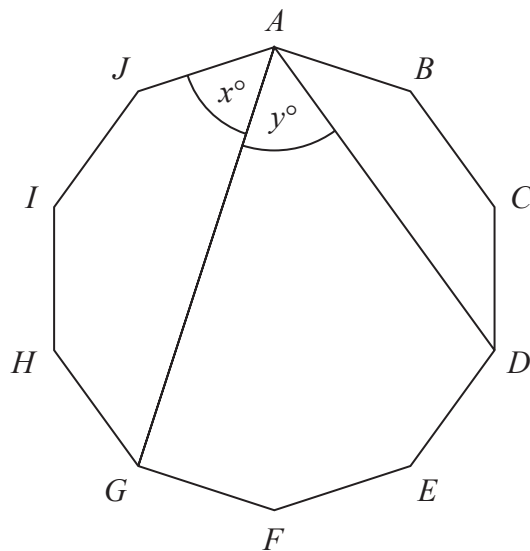
Show that *x* = *y*

(Total for Question 11 is 4 marks)

12 $a = 6 \times 10^{40}$

Work out the value of a^3
Give your answer in standard form.

....

(Total for Question 12 is 3 marks)

13 The shaded region in the diagram is bounded by three lines.
The equation of one of the lines is given.

$x + 2y = 8$
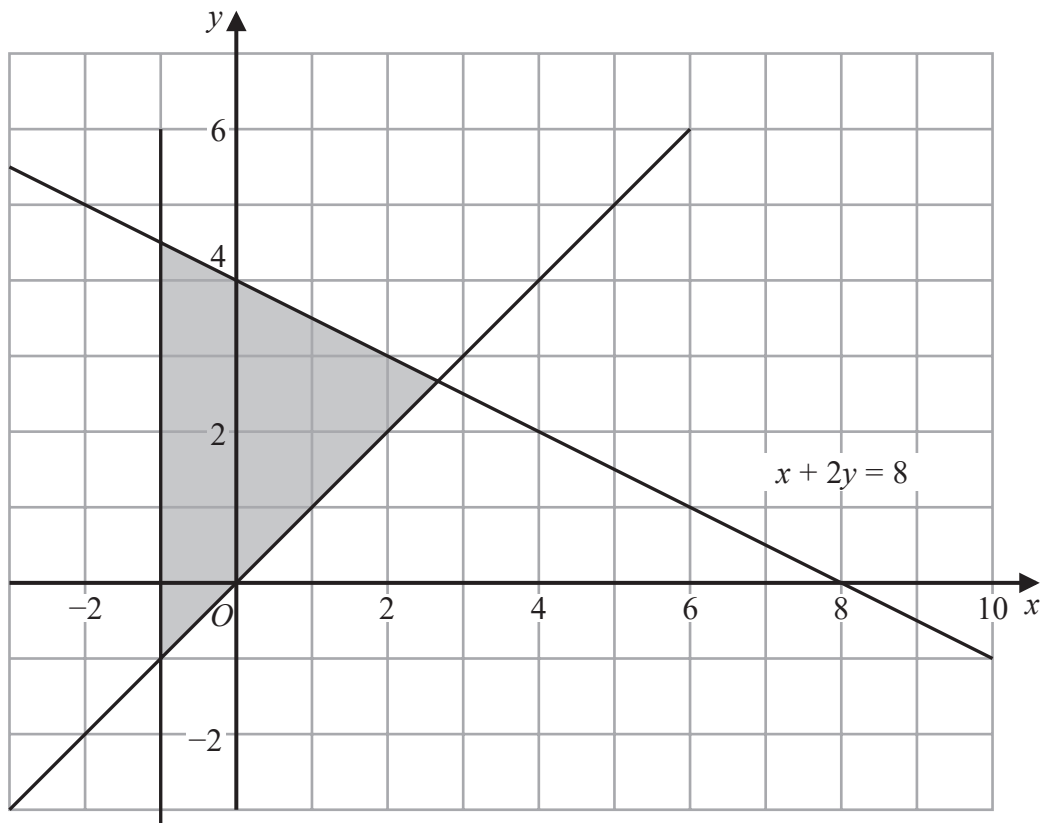
Write down three inequalities that define the shaded region.

....

....

....

(Total for Question 13 is 3 marks)

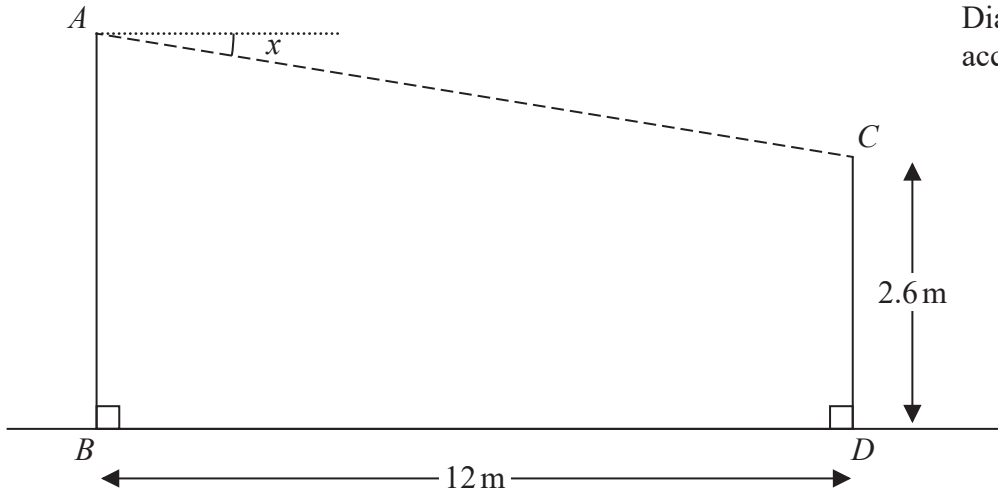P 6 9 2 0 3 A 0 1 5 2 8

14 A zip wire is shown as the dashed line *AC* in the diagram.

The zip wire is supported by two vertical posts *AB* and *CD* standing on horizontal ground.

$$CD = 2.6\,m \qquad BD = 12\,m$$

The zip wire makes an angle *x* with the horizontal, as shown in the diagram.
The design of the zip wire requires the angle *x* to be at least 5°

Work out the least possible height of the post *AB*
Give your answer correct to 3 significant figures.

.... m

(Total for Question 14 is 3 marks)

15 Diyar recorded the distance, in kilometres, that he cycled each day for 11 days.
Here are his results.

8   10   12   13   5   23   21   7   5   16   14

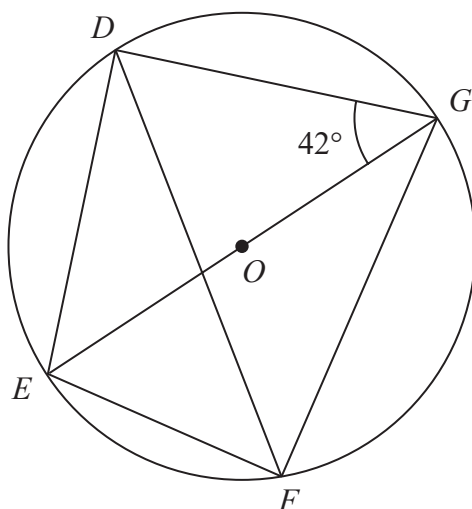Find the interquartile range of his results.

.... km

(Total for Question 15 is 3 marks)

16 *D*, *E*, *F* and *G* are points on a circle, centre *O*

Diagram **NOT**
accurately drawn

EOG is a diameter of the circle.

Angle *EGD* = 42°

Calculate the size of angle *DFG*
Give a reason for each stage of your working.

Angle *DFG* = ... °

(Total for Question 16 is 4 marks)

17 Show that $\dfrac{\sqrt{12}}{\sqrt{3}+2}$

can be written in the form $a+\sqrt{b}$ where a and b are integers.

(Total for Question 17 is 3 marks)

18 Prove that when the sum of the squares of any two consecutive odd numbers is divided by 8, the remainder is always 2

Show clear algebraic working.

(Total for Question 18 is 3 marks)