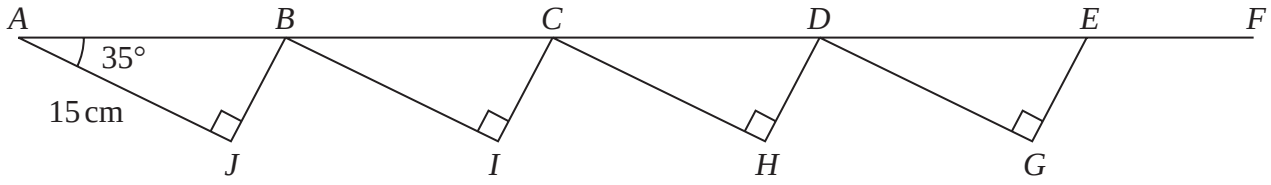
1 The diagram shows four congruent right-angled triangles *ABJ*, *BCI*, *CDH* and *DEG*.
The diagram also shows the straight line *ABCDEF*.

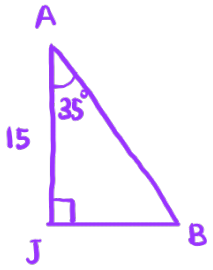
Diagram **NOT** accurately drawn



AJ = 15 cm
Angle *BAJ* = 35°

AF = 80 cm

Work out the length of *EF*.
Give your answer correct to 3 significant figures.



$\cos 35^\circ = \frac{AJ}{AB}$

$AB = \frac{AJ}{\cos 35^\circ}$

length AB = $\frac{15 \text{ cm}}{\cos 35^\circ}$ (1)

= 18.3 cm (1)

since all triangles are congruent :

length AE = 4 × 18.3 cm

= 73.2 cm (1)

length EF = AF − AE

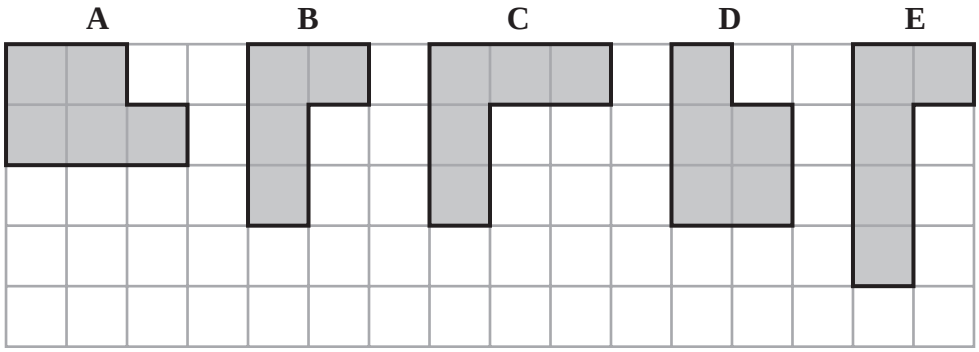
= 80 − 73.2 (1)

= 6.75 cm (1)

6.75 cm

(Total for Question 1 is 5 marks)

2 The diagram shows five shaded shapes on a grid of squares.



Two of the shapes are congruent. ← congruent = exactly the same shape and size

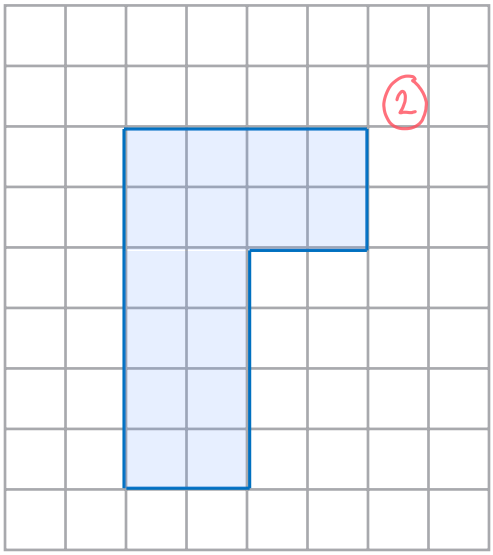
(a) Write down the letters of these shapes.

A and D (1)

(1)

(b) On the square grid below, draw a shape that is similar to but is **not** congruent to shape **B**.

↑ the same shape but NOT the same size.



(2)

(2)

All of the shapes on the grid have 6 sides.

(c) Write down the mathematical name for a shape that has 6 sides.

hexagon (1)

(1)

(Total for Question 2 is 4 marks)

3 The diagram shows two congruent isosceles triangles and parts of two congruent regular polygons, **X** and **Y**.

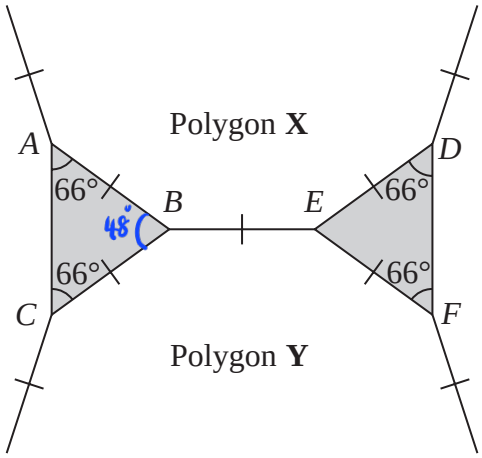


Diagram **NOT** accurately drawn

The two regular polygons each have n sides.

Work out the value of n.

angle ABC = $180^\circ - 66^\circ - 66^\circ$

= 48° (1)

Half of angle ABC = exterior angle of polygon X and Y

= $\frac{1}{2} \times 48^\circ = 24^\circ$

Exterior angle of polygon = $\frac{360^\circ}{\text{no. of sides}}$

$24^\circ = \frac{360^\circ}{n}$

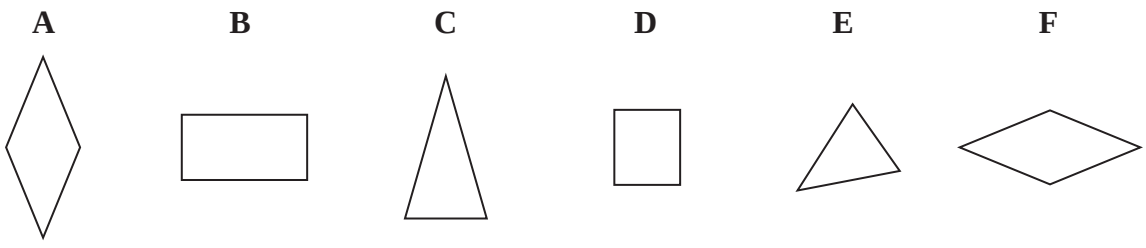
$n = \frac{360^\circ}{24^\circ}$ (1)

= 15 (1)

$n =$ 15

(Total for Question 3 is 3 marks)

Here are six shapes.



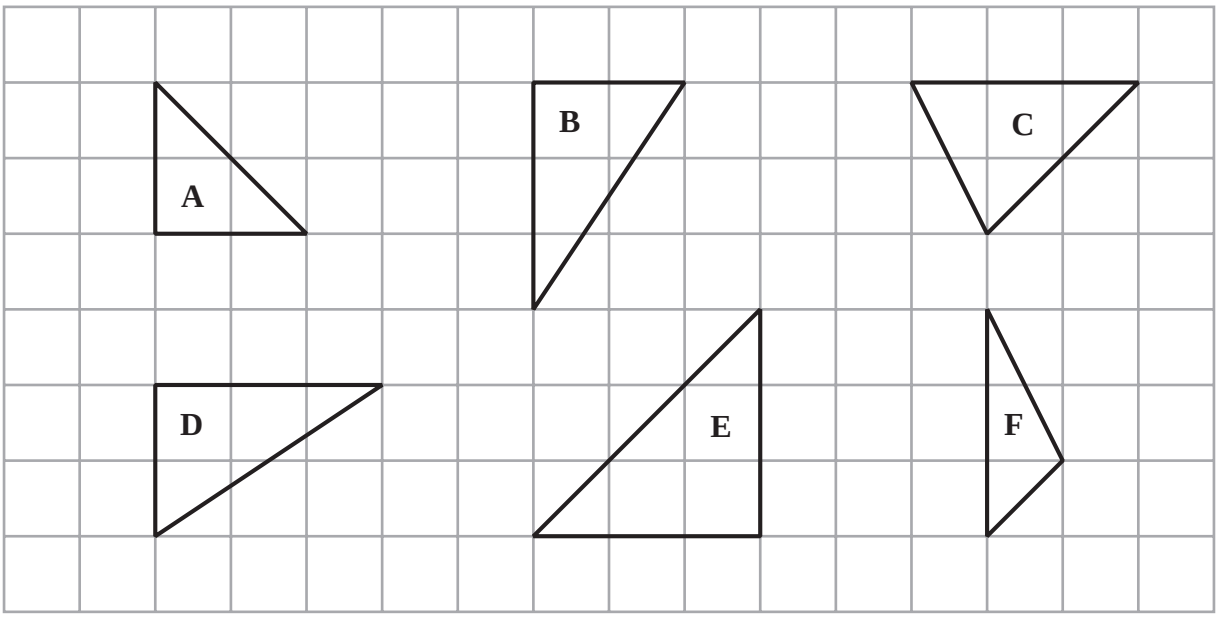
Two of these shapes are congruent. → have same shape and size

4 (c) Write down the letters of these two shapes.

A and F (1)

(Total for Question 4 is 1 marks)

Here are six triangles drawn on a grid of squares.



Two of these triangles are congruent.

5 (c) Write down the letters of these two triangles.

B and D

(1)

(Total for Question 5 is 1 marks)