

Questions

Q1.

The diagram shows a regular pentagon $ABCDE$.

$$\text{Area of } \triangle = \frac{1}{2} ab \sin C$$

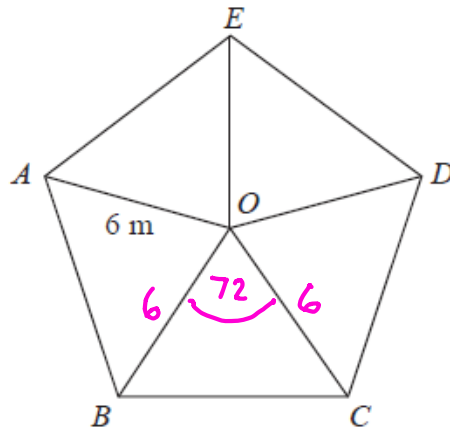


Diagram **NOT** accurately drawn

$$\text{Area} = 5 \times \frac{1}{2} \times 6 \times 6 \sin 72^\circ$$

The pentagon is divided into 5 isosceles triangles.
 $OA = OB = OC = OD = OE = 6 \text{ m}$

Work out the area of the pentagon.
 Give your answer correct to 1 decimal place.

..... **85.6** m^2

(Total for question = 4 marks)

Q2.

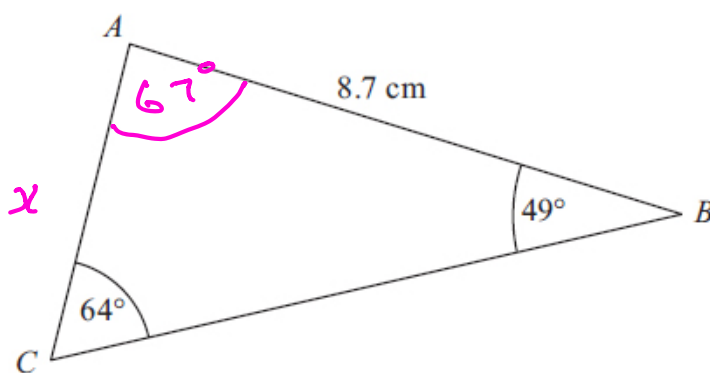


Diagram **NOT** accurately drawn

ABC is a triangle.

$AB = 8.7 \text{ cm}$.

$$\frac{x}{\sin 49^\circ} = \frac{8.7}{\sin 64^\circ}$$

$$x = \frac{8.7 \sin 49^\circ}{\sin 64^\circ}$$

Angle $ABC = 49^\circ$.
 Angle $ACB = 64^\circ$.

Calculate the area of triangle ABC .
 Give your answer correct to 3 significant figures.

$$x = \frac{8.7}{\sin 64^\circ} \times \sin 49^\circ$$

$$x = 7.305 \text{ cm}$$

$$\angle A = 180 - (64 + 49) = 67^\circ$$

$$\text{Area} = \frac{1}{2} bc \sin A$$

$$= \frac{1}{2} \times 7.305 \times 8.7 \times \sin 67^\circ$$

$$= 29.25$$

$$= 29.3 \text{ cm}^2$$

$$\dots\dots\dots 29.3 \dots\dots\dots \text{cm}^2$$

(Total for Question is 5 marks)

Q3.

* The diagram shows a triangle DEF inside a rectangle $ABCD$.

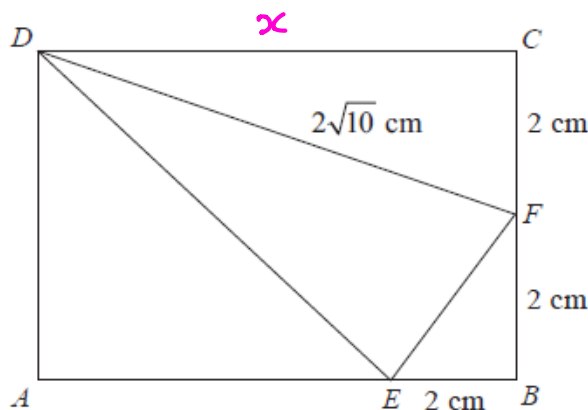


Diagram NOT
accurately drawn

$$2^2 + x^2 = (2\sqrt{10})^2$$

$$x^2 = 40 - 4$$

$$x^2 = 36$$

$$x = 6$$

Show that the area of triangle DEF is 8 cm^2 .
 You must show all your working.

Area of Δ s

$$\Delta CF = \frac{1}{2} \times 2 \times 6 = 6$$

$$\Delta BE = \frac{1}{2} \times 2 \times 2 = 2$$

$$\Delta DE = \frac{1}{2} \times 4 \times 4 = 8$$

Area of rectangle $ABCD$

$$= 6 \times 4$$

$$= 24 \text{ cm}^2$$

(Total for question = 4 marks)

$$\text{Area of } \Delta DEF = 24 - 16$$

$$16$$

$$= 8 \text{ cm}^2$$

Q4.

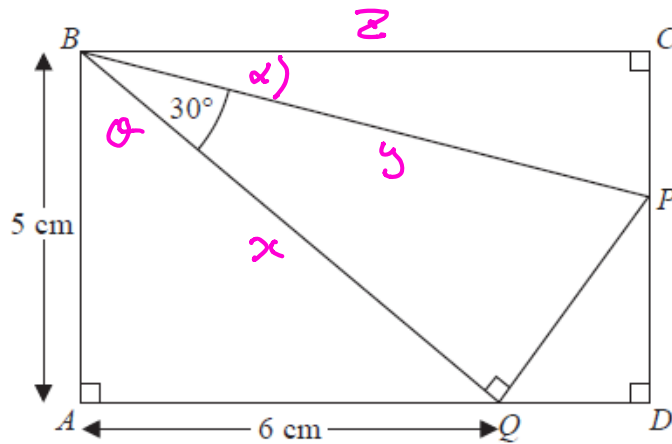


Diagram NOT accurately drawn

In the diagram,

$$5^2 + 6^2 = x^2$$

$$61 = x^2$$

$$\sqrt{61} = x$$

$ABCD$ is a rectangle

P lies on the line CD

Q lies on the line AD

PQB is a right-angled triangle

$$\cos 30 = \frac{x}{y}$$

$$y \cos 30 = x$$

$$y = \frac{x}{\cos 30} = \frac{\sqrt{61}}{\cos 30} = 9.018 \text{ cm}$$

Work out the length of BC .

Give your answer correct to 3 significant figures.

You must show your working.

$$\tan \theta = \frac{6}{5} \quad \theta = \tan^{-1}\left(\frac{6}{5}\right) = 50.2^\circ$$

$$\alpha = 90 - 30 - \theta$$

$$\alpha = 90 - 30 - 50.2$$

$$\alpha = 9.8^\circ$$

$$\cos \alpha = \frac{z}{y}$$

$$y \cos \alpha = z$$

$$z = 9.018 \cos 9.8^\circ$$

$$z = 8.89 \text{ cm}$$

$$BC = 8.89 \text{ cm}$$

(Total for question = 5 marks)

Q5.

The diagram shows a square $ABCD$ inside a circle.

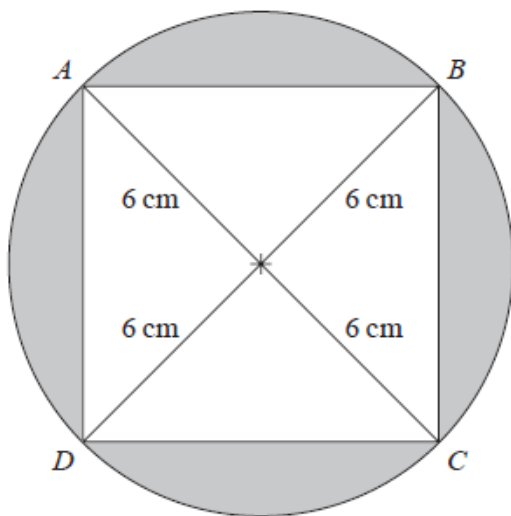


Diagram NOT
accurately drawn

$$\text{Area of each } \Delta = \frac{1}{2} \times 6 \times 6 \\ = 18 \text{ cm}^2$$

$$\text{Area of white square} = 4 \times 18 \\ = 72 \text{ cm}^2$$

$$\text{Area of circle} = \pi r^2 \\ = \pi \times 6^2 \\ = 36\pi$$

$$\text{Shaded Area} = 36\pi - 72$$

$$\dots\dots\dots 41.1 \dots\dots\dots \text{ cm}^2$$

The points A , B , C and D lie on the circle.

The radius of the circle is 6 cm.

Work out the total area of the shaded regions.
Give your answer correct to 3 significant figures.

(Total for question = 4 marks)