

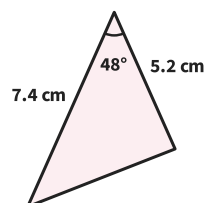
Area of a Triangle: $\frac{1}{2}ab \sin C$ stretch

ANSWERS 

1



Find the area of the triangle to 3 significant figures.



$$\frac{1}{2} \times 7.4 \times 5.2 \times \sin 48^\circ$$

$$14.3 \text{ cm}^2$$

Answer

2



In triangle PQR , $PQ = 9 \text{ m}$, $QR = 6.5 \text{ m}$ and angle $PQR = 132^\circ$. Find the area of triangle PQR to 3 significant figures.

$$\frac{1}{2} \times 9 \times 6.5 \times \sin 132^\circ$$

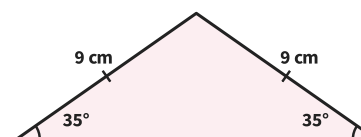
$$21.7 \text{ m}^2$$

Answer

3



Find the area of this isosceles triangle to 3 significant figures.



$$\text{top angle} = 180^\circ - 70^\circ = 110^\circ$$

$$\frac{1}{2} \times 9 \times 9 \times \sin 110^\circ$$

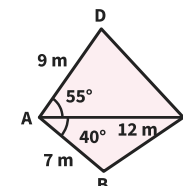
$$38.1 \text{ cm}^2$$

Answer

4



A path AC splits the garden plot $ABCD$ into two triangles. Find the area of the plot to 3 significant figures.



$$\frac{1}{2} \times 7 \times 12 \times \sin 40^\circ = 27.00$$

$$\frac{1}{2} \times 9 \times 12 \times \sin 55^\circ = 44.23$$

$$71.2 \text{ m}^2$$

Answer

5



Show that the area of an equilateral triangle with sides of 10 cm is $25\sqrt{3} \text{ cm}^2$.

$$\text{each angle is } 60^\circ, \sin 60^\circ = \frac{\sqrt{3}}{2}$$

$$\frac{1}{2} \times 10 \times 10 \times \frac{\sqrt{3}}{2} = 25\sqrt{3}$$

$$25\sqrt{3} \text{ cm}^2$$

Answer

6



A triangle has sides $x \text{ cm}$ and 12 cm with an angle of 40° between them. Its area is 30 cm^2 . Mia writes $\sin 40^\circ \approx 0.6$, so $x = 30 \div 3.6 = 8.33$. Explain her mistake and find x to 3 significant figures.

$$\text{she rounded } \sin 40^\circ \text{ too early}$$

$$x = 30 \div (6 \times \sin 40^\circ)$$

$$x = 7.78 \text{ cm}$$

Answer

7



A triangle has sides of 8 cm and 12 cm and an area of 40 cm^2 . Find both possible sizes of the angle between those sides, to 1 decimal place.

$$\sin C = 40 \div 48 = 0.8333$$

$$180^\circ - 56.4^\circ = 123.6^\circ$$

$$56.4^\circ \text{ or } 123.6^\circ$$

Answer

8



A triangle has two sides of 6 cm and 9 cm. Explain why its area can never be more than 27 cm^2 .

$$\text{area} = \frac{1}{2} \times 6 \times 9 \times \sin C = 27 \sin C$$

$$27 \text{ at most, when } C = 90^\circ$$

$$\sin \text{ is never more than } 1$$

Reason