

Area of a Triangle Using Sin

Tip: Draw the triangles and label them with given sides and angles.

1. Find the area of a triangle with sides $AB = 7$ cm, $AC = 10$ cm, and included angle $\angle BAC = 40^\circ$
2. A triangle has two sides measuring 5 cm and 12 cm, with an included angle of 90° . Calculate its area.
3. In triangle PQR, $PQ = 8$ m, $QR = 13$ m, and $\angle Q = 75^\circ$. Find the area of triangle PQR.
4. Calculate the area of a triangle where two sides are 9 cm and 15 cm, and the included angle is 47° .
5. An isosceles triangle has two equal sides of 10 cm and an included angle of 62° . Find its area.
6. A triangle has sides of 20 m and 18 m with an included angle of 105° . Find the area, rounding to two decimal places.
7. The area of a triangle is 24 cm^2 . If two of its sides are 6 cm and 8 cm, find the measure of the included angle.
8. A triangle has an area of 30 m^2 and two sides measuring 10 m and 9 m. What is the included angle? (Give your answer to the nearest degree.)
9. In triangle XYZ, $XY = 14$ cm, $YZ = 11$ cm, and $\angle Y = 120^\circ$. Calculate the area.
10. A triangle has sides of 25 cm and 17 cm, and an included angle of 38° . Find its area, rounding to the nearest whole number.

Answer Key

1. Area = $\frac{1}{2} \times 7 \times 10 \times \sin 40^\circ \approx 22.51 \text{ cm}^2$
2. Area = $\frac{1}{2} \times 5 \times 12 \times \sin 90^\circ = 30 \text{ cm}^2$
3. Area = $\frac{1}{2} \times 8 \times 13 \times \sin 75^\circ \approx 50.29 \text{ m}^2$
4. Area = $\frac{1}{2} \times 9 \times 15 \times \sin 47^\circ \approx 49.36 \text{ cm}^2$
5. Area = $\frac{1}{2} \times 10 \times 10 \times \sin 62^\circ \approx 44.13 \text{ cm}^2$
6. Area = $\frac{1}{2} \times 20 \times 18 \times \sin 105^\circ \approx 173.93 \text{ m}^2$
7. $24 = \frac{1}{2} \times 6 \times 8 \times \sin \theta \Rightarrow \sin \theta = 1 \Rightarrow \theta = 90^\circ$
8. $30 = \frac{1}{2} \times 10 \times 9 \times \sin \theta \Rightarrow \sin \theta = \frac{2 \times 30}{90} = 0.6667 \Rightarrow \theta \approx 42^\circ$
9. Area = $\frac{1}{2} \times 14 \times 11 \times \sin 120^\circ \approx 66.62 \text{ cm}^2$
10. Area = $\frac{1}{2} \times 25 \times 17 \times \sin 38^\circ \approx 130 \text{ cm}^2$