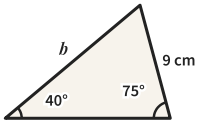


Sine rule and area

1

Find the side b , then the area of the triangle. Give each answer to 1 decimal place.



$$b = 9 \sin 75^\circ \div \sin 40^\circ = 13.5$$

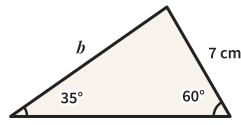
$$\text{Area} = \frac{1}{2} \times 9 \times 13.5 \times \sin 65^\circ$$

$$\text{Area} = 55.2 \text{ cm}^2$$

Answer 13.5 cm, 55.2 cm²

2

Find the side b , then the area of the triangle. Give each answer to 1 decimal place.



$$b = 7 \sin 60^\circ \div \sin 35^\circ = 10.6$$

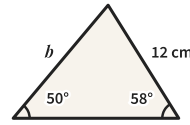
$$\text{Area} = \frac{1}{2} \times 7 \times 10.6 \times \sin 85^\circ$$

$$\text{Area} = 36.9 \text{ cm}^2$$

Answer 10.6 cm, 36.9 cm²

3

Find the side b , then the area of the triangle. Give each answer to 1 decimal place.



$$b = 12 \sin 58^\circ \div \sin 50^\circ = 13.3$$

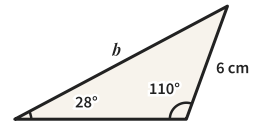
$$\text{Area} = \frac{1}{2} \times 12 \times 13.3 \times \sin 72^\circ$$

$$\text{Area} = 75.8 \text{ cm}^2$$

Answer 13.3 cm, 75.8 cm²

4

Find the side b , then the area of the triangle. Give each answer to 1 decimal place.

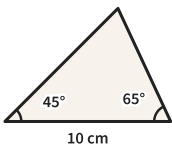


$$\text{Area} = 24.1 \text{ cm}^2$$

Answer 12.0 cm, 24.1 cm²

5

Find the area of this triangle. Give your answer to 1 decimal place.



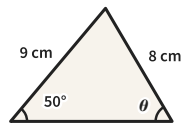
the third angle is 70° : $BC = 10 \sin 45^\circ \div \sin 70^\circ = 7.5$, then
 $\frac{1}{2} \times 10 \times 7.5 \times \sin 65^\circ$

$$34.1 \text{ cm}^2$$

Answer 34.1 cm²

6

Angle θ is acute. Find θ , then the area of the triangle.



$\sin \theta = 9 \sin 50^\circ \div 8$, then the third angle is 70.5°

$$59.5^\circ, 33.9 \text{ cm}^2$$

Answer 59.5°, 33.9 cm²

7

A triangular field has one side of 80 m. The angles at each end of that side are 52° and 64° . Find the area of the field to the nearest square metre.

the third angle is 64° : a second side is $80 \sin 52^\circ \div \sin 64^\circ = 70.1 \text{ m}$

$$2522 \text{ m}^2$$

Answer 2522 m²

8

A triangle has angles of 40° , 60° and 80° . Its shortest side is 5 cm. Find its area to 1 decimal place.

5 cm is opposite 40° ; the side opposite 60° is 6.7; the angle between them is 80°

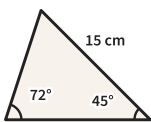
$$16.6 \text{ cm}^2$$

Answer 16.6 cm²

Sine rule and area further practice

9

Find the area of this triangle to 1 decimal place.



the side opposite 45° is 11.2, the angle between them is 63°

$$74.5 \text{ cm}^2$$

Answer 74.5 cm²

10

A plot of land is a triangle PQR . $PQ = 120 \text{ m}$, angle $P = 48^\circ$ and angle $Q = 57^\circ$. Find its area to the nearest square metre.

angle $R = 75^\circ$, $QR = 120 \sin 48^\circ \div \sin 75^\circ = 92.3$

$$4646 \text{ m}^2$$

Answer 4646 m²

11

In triangle ABC , $BC = 11 \text{ cm}$, $AB = 9 \text{ cm}$ and angle $A = 62^\circ$. Find the area of the triangle.

$\sin C = 9 \sin 62^\circ \div 11$, $C = 46.3^\circ$, so
 $B = 71.7^\circ$

$$47.0 \text{ cm}^2$$

Answer 47.0 cm²

12

A triangle has angles of 25° , 35° and 120° . Its longest side is 14 cm. Find its area to 1 decimal place.

14 cm is opposite 120° ; the side opposite 25° is 6.8; the angle between them is 35°

$$27.4 \text{ cm}^2$$

Answer 27.4 cm²

13

Triangle ABC has an area of 50 cm^2 . Angle $A = 40^\circ$, angle $B = 75^\circ$ and angle $C = 65^\circ$. Find the length of AB .

$AC = AB \sin 75^\circ \div \sin 65^\circ$, then
 $\frac{1}{2} \times AB \times AC \times \sin 40^\circ = 50$

$$12.1 \text{ cm}$$

Answer 12.1 cm

14

$ABCD$ is a parallelogram. $AB = 9 \text{ cm}$, angle $ABD = 32^\circ$ and angle $ADB = 49^\circ$. Find the area of the parallelogram.

$AD = 9 \sin 32^\circ \div \sin 49^\circ = 6.3$,
 triangle $ABD = \frac{1}{2} \times 9 \times 6.3 \times \sin 99^\circ$,
 then double it

$$56.2 \text{ cm}^2$$

Answer 56.2 cm²

15

A sail is a triangle. Its bottom edge is 3.2 m long and the angles at each end of the bottom edge are 70° and 45° . Find the area of the sail to 2 decimal places.

the top angle is 65° ; the side opposite 45° is 2.50 m; the angle between it and the bottom edge is 70°

$$3.75 \text{ m}^2$$

Answer 3.75 m²

16

In this triangle Leo works out the area as $\frac{1}{2} \times 8 \times 10 \times \sin 50^\circ$. Explain his mistake and find the area.



50° is not between the 8 cm and 10 cm sides: the angle between them is 92.2°

$$40.0 \text{ cm}^2$$

Answer 40.0 cm²