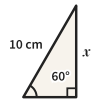
Exact trig values and surds

ANSWERS

1

Find the exact value of x. Give your answer as a simplified surd.



$\sin 60° = \frac{\sqrt{3}}{2}$

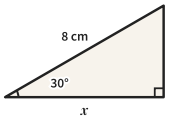
$x = 10 \times \frac{\sqrt{3}}{2}$

$x = 5\sqrt{3}$ cm

Answer $5\sqrt{3}$ cm

2

Find the exact value of x. Give your answer as a simplified surd.



$\cos 30° = \frac{\sqrt{3}}{2}$

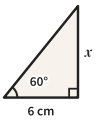
$x = 8 \times \frac{\sqrt{3}}{2}$

$x = 4\sqrt{3}$ cm

Answer $4\sqrt{3}$ cm

3

Find the exact value of x. Give your answer as a simplified surd.



$\tan 60° = \sqrt{3}$

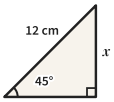
$x = 6 \times \sqrt{3}$

$x = 6\sqrt{3}$ cm

Answer $6\sqrt{3}$ cm

4

Find the exact value of x. Give your answer as a simplified surd.

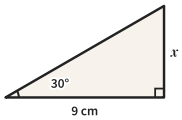


$x = 6\sqrt{2}$ cm

Answer $6\sqrt{2}$ cm

5

Find the exact value of x. Give your answer as a simplified surd.



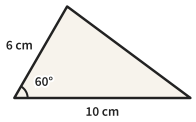
$\tan 30° = \frac{1}{\sqrt{3}}$, so $x = \frac{9}{\sqrt{3}} = \frac{9\sqrt{3}}{3}$

$3\sqrt{3}$ cm

Answer

6

Find the exact area of this triangle. Give your answer as a simplified surd.



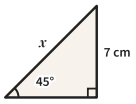
$\frac{1}{2} \times 6 \times 10 \times \frac{\sqrt{3}}{2}$

$15\sqrt{3}$ cm^2

Answer

7

Find the exact value of x. Give your answer as a simplified surd.



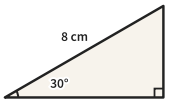
$x = 7 \div \frac{\sqrt{2}}{2} = \frac{14}{\sqrt{2}} = 7\sqrt{2}$

$7\sqrt{2}$ cm

Answer

8

Find the exact perimeter of this triangle. Give your answer in the form $a + b\sqrt{3}$.



the sides are 8 sin 30° = 4 and 8 cos 30° = $4\sqrt{3}$

$12 + 4\sqrt{3}$ cm

Answer

Exact trig values and surds *further practice*

ANSWERS

9

Work out the exact value of sin 60° × tan 30°.

$\frac{\sqrt{3}}{2} \times \frac{\sqrt{3}}{3} = \frac{3}{6}$

$\frac{1}{2}$

Answer

10

An equilateral triangle has sides of 6 cm. Find its exact area as a simplified surd.

height 6 sin 60° = $3\sqrt{3}$, area $\frac{1}{2} \times 6 \times 3\sqrt{3}$

$9\sqrt{3}$ cm^2

Answer

11

A triangle has sides of $4\sqrt{2}$ cm and 5 cm with an angle of 45° between them. Find its exact area.

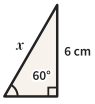
$\frac{1}{2} \times 4\sqrt{2} \times 5 \times \frac{\sqrt{2}}{2} : \sqrt{2} \times \sqrt{2} = 2$

10 cm^2

Answer

12

Find the exact value of x as a simplified surd.



$6 \div \frac{\sqrt{3}}{2} = \frac{12}{\sqrt{3}} = 4\sqrt{3}$

$4\sqrt{3}$ cm

Answer

13

Work out the exact value of cos 30° × cos 45°. Simplify your answer.

$\frac{\sqrt{3}}{2} \times \frac{\sqrt{2}}{2}$

$\frac{\sqrt{6}}{4}$

Answer

14

A straight ramp is $4\sqrt{3}$ m long and makes an angle of 30° with the ground. Find the exact height of its top and the exact distance along the ground.

$4\sqrt{3} \times \frac{1}{2}$ and $4\sqrt{3} \times \frac{\sqrt{3}}{2} = \frac{12}{2}$

$2\sqrt{3}$ m high, 6 m along

Answer

15

A right angled triangle has an angle of 30°. The side next to it, not the hypotenuse, is 5 cm. Find the exact length of the hypotenuse with a rational denominator.

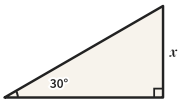
$5 \div \frac{\sqrt{3}}{2} = \frac{10}{\sqrt{3}}$, then $\times \frac{\sqrt{3}}{\sqrt{3}}$

$\frac{10\sqrt{3}}{3}$ cm

Answer

16

Kim finds x with $\tan 30° = \sqrt{3}$ and writes $x = 6\sqrt{3}$ cm. Explain her mistake and find the exact value of x.



$\sqrt{3}$ is tan 60°; tan 30° = $\frac{1}{\sqrt{3}}$, so

$x = \frac{6}{\sqrt{3}} = 2\sqrt{3}$

$2\sqrt{3}$ cm

Answer