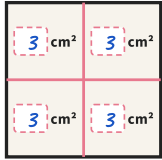


Simplifying Surds

ANSWERS

1 Simplify $\sqrt{12}$

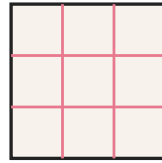


12 cm² cut into 4 equal squares. The big side is two small sides.

$$\begin{aligned}\sqrt{12} &= \sqrt{4 \times 3} \\ &= \sqrt{4} \times \sqrt{3} \\ &= 2\sqrt{3}\end{aligned}$$

Answer 2√3

2 Simplify $\sqrt{18}$



18 cm² cut into 9 equal squares.

$$\begin{aligned}\sqrt{18} &= \sqrt{9 \times 2} \\ &= \sqrt{9} \times \sqrt{2} \\ &= 3\sqrt{2}\end{aligned}$$

Answer 3√2

3 Simplify $\sqrt{50}$

$$\begin{aligned}\sqrt{50} &= \sqrt{25 \times 2} \\ &= \sqrt{25} \times \sqrt{2} \\ &= 5\sqrt{2}\end{aligned}$$

Answer 5√2

4 Simplify $\sqrt{45}$

$$\begin{aligned}\sqrt{45} &= \sqrt{9 \times 5} \\ &= \sqrt{9} \times \sqrt{5} \\ &= 3\sqrt{5}\end{aligned}$$

Answer 3√5

5 Simplify $3\sqrt{20}$

$$\begin{aligned}3\sqrt{20} &= 3 \times \sqrt{4 \times 5} \\ &= 3 \times \sqrt{4} \times \sqrt{5} \\ &= 6\sqrt{5}\end{aligned}$$

Answer 6√5

6 Simplify $\sqrt{12} + \sqrt{27}$

$$\begin{aligned}\sqrt{12} &= 2\sqrt{3} \\ \sqrt{27} &= 3\sqrt{3}\end{aligned}$$

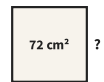
Answer 5√3

7 Simplify $\sqrt{6} \times \sqrt{3}$

$$\sqrt{6} \times \sqrt{3} = \sqrt{18}$$

Answer 3√2

8 A square has an area of 72 cm². Find the length of one side as a surd in its simplest form.



$$\sqrt{72}$$

Answer 6√2 cm

Simplifying Surds further practice

ANSWERS

9 Simplify $\sqrt{48}$

$$\sqrt{16 \times 3}$$

Answer 4√3

10 Write $4\sqrt{5}$ as the square root of a single number.

$$4 = \sqrt{16}$$

Answer √80

11 Which is bigger? $3\sqrt{7}$ or $2\sqrt{15}$

$$3\sqrt{7} = \sqrt{63} \text{ and } 2\sqrt{15} = \sqrt{60}$$

Answer 3√7

12 A rectangle is $\sqrt{20}$ cm long and $\sqrt{45}$ cm wide. Find its perimeter in its simplest form.

$$2 \times (2\sqrt{5} + 3\sqrt{5})$$

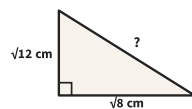
Answer 10√5 cm

13 Expand and simplify $\sqrt{3}(\sqrt{12} + 5)$

$$\sqrt{36} + 5\sqrt{3}$$

Answer 6 + 5√3

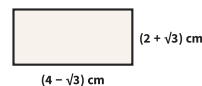
14 Find the length of the longest side. Give your answer as a surd in its simplest form.



$$\sqrt{12}^2 + \sqrt{8}^2 = 12 + 8 = 20$$

Answer 2√5 cm

15 Find the area of this rectangle. Give your answer in the form $a + b\sqrt{3}$.



$$8 - 2\sqrt{3} + 4\sqrt{3} - 3$$

Answer 5 + 2√3 cm²

16 $\sqrt{18} + \sqrt{50} = \sqrt{n}$ Find the value of n .

$$3\sqrt{2} + 5\sqrt{2} = 8\sqrt{2} = \sqrt{128}$$

Answer n = 128