

# Surds 2

To be able to simplify surds

No Calculator

(Q1)

$$64^{\frac{1}{6}}$$

Connect

(Q2)

Is this a irrational number?

$$\sqrt{6}$$

(Q3) Simplify

$$4\sqrt{50}$$

(Q4)

NEW

Simplify

$$\frac{4\sqrt{50}}{2\sqrt{2}}$$

No Calculator

(Q1)

$$64^{\frac{1}{6}}$$

2

Connect

ANSWERS

(Q2)

Is this a irrational number?

$$\sqrt{6}$$

Yes, it is a surd

(Q3) Simplify

$$4\sqrt{50}$$

$$20\sqrt{2}$$

(Q4)

NEW

Simplify

$$\frac{4\sqrt{50}}{2\sqrt{2}}$$

10

## Multiplying Surds

Activate

**Tip:** Be very careful in observing whether both of the terms are surds or just one is.

$$\sqrt{3} \times \sqrt{5} =$$

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

$$\sqrt{5} \times 3 =$$

$$\sqrt{2} \times \sqrt{8} =$$

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

## Multiplying Surds

**Tip:** Be very careful in observing whether both of the terms are surds or just one is.

$$\sqrt{3} \times \sqrt{5} = \sqrt{15}$$

$$\rightarrow 2 \times \sqrt{3} = 2\sqrt{3}$$

$$\sqrt{5} \times 3 = 3\sqrt{5}$$

$$\sqrt{2} \times \sqrt{8} = \sqrt{16} = 4$$

$$\sqrt{3} \times \sqrt{3} = \sqrt{9} = 3$$

Activate  
ANSWERS

## Multiplying Surds

Activate

**Tip:** Just multiply the whole number first, then the surds.

$$2\sqrt{3} \times 2\sqrt{5} =$$

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

$$\sqrt{18} \times 4\sqrt{2} =$$

## Multiplying Surds

**Tip:** Just multiply the whole number first, then the surds.

$$2\sqrt{3} \times 2\sqrt{5} = 4\sqrt{15}$$

$$3\sqrt{2} \times 3\sqrt{2} = 18$$

$$\sqrt{18} \times 4\sqrt{2} = 24$$

Activate  
**ANSWERS**

No Calculator

(Q1)

$$6 \times \sqrt{7} =$$

Demonstrate

(Q2)

$$\sqrt{5} \times \sqrt{6} =$$

(Q3)  $5\sqrt{3} \times 4\sqrt{3} =$

(Q4)  $3\sqrt{2} \times 2\sqrt{6} =$

(Q5)

$$\frac{\sqrt{96}}{\sqrt{8}}$$



No Calculator

$$(Q1) \quad 6 \times \sqrt{7} = 6\sqrt{7}$$

Demonstrate

ANSWERS

$$(Q2) \quad \sqrt{5} \times \sqrt{6} = \sqrt{30}$$

$$(Q3) \quad 5\sqrt{3} \times 4\sqrt{3} = 60$$

$$(Q4) \quad 3\sqrt{2} \times 2\sqrt{6} = 12\sqrt{3}$$

$$(Q5) \quad \frac{\sqrt{96}}{\sqrt{8}} = 2\sqrt{3}$$

Do them in your book and show all the steps

Demonstrate

## No Calculator

3 Simplify the following:

a  $\sqrt{3} \times \sqrt{2} \times \sqrt{5} =$

b  $\sqrt{27} \times \sqrt{3} =$

c  $4\sqrt{3} \times 2 =$

d  $5 \times 2\sqrt{5} =$

e  $2\sqrt{2} \times 2\sqrt{2} =$

f  $7\sqrt{3} \times 2\sqrt{5} =$

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

h)  $(3\sqrt{5})^2 =$

10 a **Reasoning** A surd simplifies to  $4\sqrt{5}$ .  
What could the original surd be?

4 Simplify the following:

a  $\sqrt{8} \times 3\sqrt{2} =$

b  $\sqrt{27} \times 2\sqrt{3} =$

c  $3\sqrt{18} \times \sqrt{2} =$

d  $2\sqrt{12} \times 3\sqrt{3} =$

Simplify each of the following:

Q1)  $\frac{\sqrt{108}}{\sqrt{2}}$

Q4)  $\frac{\sqrt{144}}{\sqrt{3}}$

Q7)  $\frac{\sqrt{135}}{\sqrt{5}}$

Q2)  $\frac{\sqrt{162}}{\sqrt{6}}$

Q5)  $\frac{\sqrt{120}}{\sqrt{5}}$

Q8)  $\frac{\sqrt{192}}{\sqrt{4}}$

Q3)  $\frac{\sqrt{168}}{\sqrt{6}}$

Q6)  $\frac{\sqrt{48}}{\sqrt{4}}$

Q9)  $\frac{\sqrt{200}}{\sqrt{4}}$

**3** Simplify the following:

**a**  $\sqrt{3} \times \sqrt{2} \times \sqrt{5} = \sqrt{30}$

**b**  $\sqrt{27} \times \sqrt{3} = 9$

**c**  $4\sqrt{3} \times 2 = 8\sqrt{3}$

**d**  $5 \times 2\sqrt{5} = 10\sqrt{5}$

**e**  $2\sqrt{2} \times 2\sqrt{2} = 8$

**f**  $7\sqrt{3} \times 2\sqrt{5} = 14\sqrt{15}$

**g**  $6\sqrt{3} \times 2\sqrt{3} = 36$

**h)**  $(3\sqrt{5})^2 = \mathbf{45}$

$\mathbf{\sqrt{80}}$

**10 a Reasoning** A surd simplifies to  $4\sqrt{5}$ .  
What could the original surd be?

**4** Simplify the following:

**a**  $\sqrt{8} \times 3\sqrt{2} = 12$

**b**  $\sqrt{27} \times 2\sqrt{3} = 18$

**c**  $3\sqrt{18} \times \sqrt{2} = 18$

**d**  $2\sqrt{12} \times 3\sqrt{3} = 36$

Demonstrate  
**ANSWERS**

Q1)  $3\sqrt{6}$

Q4)  $4\sqrt{3}$

Q7)  $3\sqrt{3}$

Q2)  $3\sqrt{3}$

Q5)  $2\sqrt{6}$

Q8)  $4\sqrt{3}$

Q3)  $2\sqrt{7}$

Q6)  $2\sqrt{3}$

Q9)  $5\sqrt{2}$

Consolidate

Simplify

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

Simplify

Consolidate  
**ANSWER**

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

$$\begin{aligned} & 6\sqrt{12} \\ &= 6\sqrt{4}\sqrt{3} \\ &= 12\sqrt{3} \end{aligned}$$