

TK Maths Tuition

Worksheet 1: Surds Basics

SECTION A — Starter Questions (Simple)

1. Evaluate:

(a) $\sqrt{16}$ (b) $\sqrt{49}$ (c) $\sqrt{121}$

2. Simplify:

(a) $\sqrt{28}$ (b) $\sqrt{45}$ (c) $\sqrt{98}$

3. Write in the form $a\sqrt{b}$:

(a) $\sqrt{72}$ (b) $\sqrt{50}$ (c) $\sqrt{18}$

SECTION B — Medium Level

4. Simplify fully:

(a) $3\sqrt{12}$ (b) $5\sqrt{27}$ (c) $2\sqrt{8} + 4\sqrt{2}$

5. Write the exact value of:

(a) $\sqrt{6} \times \sqrt{15}$

$$\frac{5(b)\sqrt{20}}{\sqrt{5}}$$

6. Rationalise the denominator:

$$(a) \frac{5}{\sqrt{3}}$$

$$(b) \frac{7}{2\sqrt{5}}$$

SECTION C — Harder Surd Algebra

7. Expand and simplify:

(a) $(\sqrt{3} + 2)(\sqrt{3} - 2)$ (b) $(2 + \sqrt{5})^2$

8. Simplify fully:

(a) $\sqrt{48} - 2\sqrt{3}$ (b) $3\sqrt{32} + \sqrt{2}$

9. Write in the form $a + b\sqrt{2}$:

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

SECTION D — Worded Surd Problem

10. A right-angled triangle has legs $\sqrt{18}$ cm and 3 cm.
Find the exact length of the hypotenuse.

SECTION E — Challenge

11. Given $x = \sqrt{3} + \sqrt{2}$ and $y = \sqrt{3} - \sqrt{2}$, work out:
(a) $x + y$ (b) xy (c) Why is xy not a surd?

12. Write in the form $a + b\sqrt{5}$:
 $(3 + \sqrt{5})(2 - \sqrt{5})$

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