Surds and fractional powers

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A sample from this topic. The complete topic collection contains three different resources and worked solutions.

Read the explanation and worked example. Show your working; use a calculator only where asked.

What you will practise

• Simplify surds and interpret rational exponents.

• Explain a method and check the reasonableness of a result.

Useful starting skills: Use the prerequisite operations and representations shown in the worked example.

For positive a, $a^{(m/n)}$ is the nth root of a, raised to power m. Factor perfect squares from a square root to simplify a surd.

Combine like surds after simplifying. Multiplying or rationalising denominators uses algebraic identities; the square root of a sum cannot generally be split into separate roots.

Worked example

Simplify $\sqrt{72}+\sqrt{18}$.

$\sqrt{72}=6\sqrt{2}$ and $\sqrt{18}=3\sqrt{2}$.

Add the like surds.

Answer: $9\sqrt{2}$

Try it yourself

Name: _____ Date: _____

1. Simplify $\sqrt{48}$.

2. Evaluate $27^{(2/3)}$.

Answers and explanations

Check the method as well as the final answer. An alternative correct method is also valid.

1. $4\sqrt{3}$

$48=16\times3$.

2. 9

Cube root 27 is 3; square it.

Curriculum reference: VC2M10AN01; VC2M10AN02

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