

SC Algebra 1
8.7 Exponential Equations

Warm Up:

Simplify.

1. $8\sqrt{3} - 2\sqrt{3}$

2. $18\sqrt{7} - 11\sqrt{3} + 2\sqrt{7}$

3. $\sqrt{96} - \sqrt{24} + \sqrt{216}$

4. $2\sqrt{80} - 3\sqrt{5}$

5. $\sqrt{72z} - \sqrt{18z}$

Speak Like A Mathematician:

exponential equation – an equation in which the _____ is an _____.

Example 1: Solve a One-Step Exponential Equation

Solve.

$$5^x = 625$$

$$3^x = 243$$

$$2^x = 512$$

How can I meet today's standards?

I can solve equations involving expressions with radicals and rational exponents.

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Example 2: Solve a Multistep Exponential Equation

Simplify.

$$27^{x-1} = 3$$

$$256^{x-2} = 4$$

$$121^{\frac{7}{2}-x} = 11$$

Example 3: Real World Exponential Equations

- A. In the 1950's scientists proposed a space station that could house a crew of approximately 80 people. The station could produce artificial gravity by rotating at a speed of $w = \sqrt{gr}$, where g is 32 feet per second squared, and r is the radius of the station. If the station design required a rotation speed of 64 feet per second to simulate gravity on earth, what would the radius need to be?
- B. The degree to which sunscreen protects your skin is measured by its sun protection factor (SPF). For a sunscreen with SPF f , the percentage of UV-B rays absorbed p is $p = 50f^{\frac{1}{5}}$. What SPF absorbs 100% of UV-B rays?