

Radical Expressions

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Pre-Calculus Mathematics for Business and
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Sub-Topics

1. Radical Expressions
2. Find the Domain of a Radical Expression
3. Square-Root Multiplication
4. Rationalize the Denominator
5. Simplify a Higher Radical Expression
6. Simplify a Difference of Radical Expression
7. Radical Simplified to a Quadratic

Radical Expressions

- **Radical Expressions** contain a $\sqrt{\quad}$ symbol. This could be the square-root ($\sqrt{\quad}$), cube-root $\sqrt[3]{\quad}$, or any root.
- Many roots create an **irrational number** – a number that cannot be written as a simple fraction (ie $\sqrt{2}$, π).
- The root of a negative number (ie $\sqrt{-16}$) is **undefined** and (known as an imaginary number).

Graph: $f(x) = \sqrt{x}$

Find the Domain of a Radical Expression: Write your answer using interval notation.

$$f(x) = \sqrt{-8x + 24}$$

Example – consider alternative expressions of: $\sqrt[3]{250x}$

Square-root Multiplication: Simplify:

$$\sqrt{24} \times 3\sqrt{98}$$

Rationalize the Denominator and simplify:

$$\frac{-4}{2\sqrt{3} - 3}$$

Simplify a higher radical expression:

$$\sqrt[4]{48s^{19}t^{12}}$$

Simplify a Difference of Radical Expression: Assume that all variables represent positive real numbers.

$$y\sqrt{50x^3} - 9x\sqrt{2xy^2}$$

Simplify the radical to a quadratic: Solve for y , where y is a real number.

$$\sqrt{4y - 7} = y - 3$$