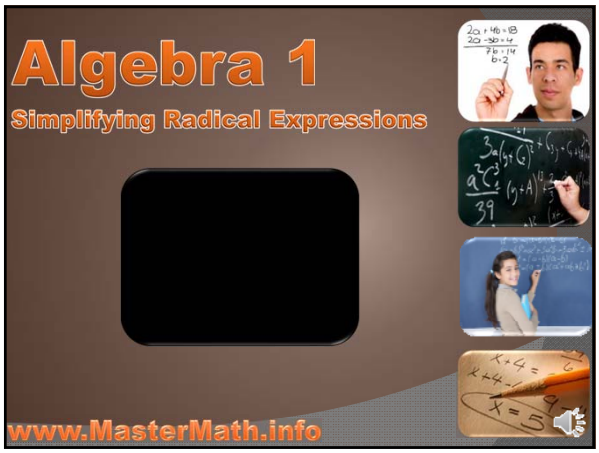
Algebra 1
Simplifying Radical Expressions
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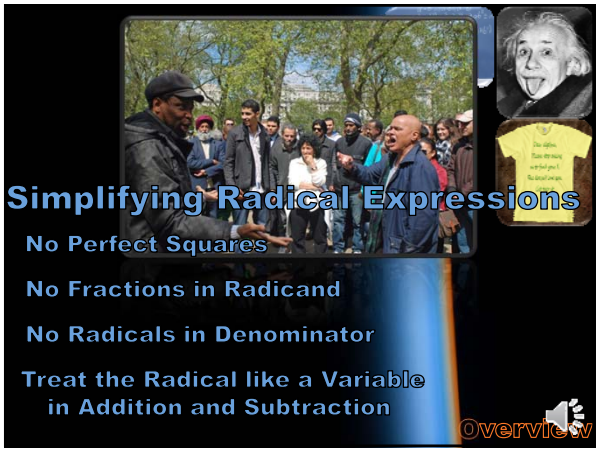
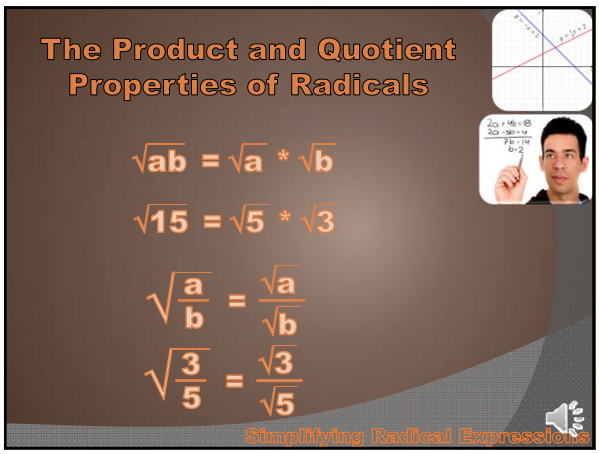

Simplifying Radical Expressions
No Perfect Squares
No Fractions in Radicand
No Radicals in Denominator
Treat the Radical like a Variable in Addition and Subtraction
Overview


The Product and Quotient Properties of Radicals
$\sqrt{ab} = \sqrt{a} * \sqrt{b}$
$\sqrt{15} = \sqrt{5} * \sqrt{3}$
$\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$
$\sqrt{\frac{3}{5}} = \frac{\sqrt{3}}{\sqrt{5}}$
Simplifying Radical Expressions

The Rules:

1. No Perfect Squares

$\sqrt{16}\,x = 4x$

2. No Fractions in Radicand

$\sqrt{2/5} = \frac{\sqrt{2}}{\sqrt{5}}$

3. No Radicals in Denominator

$\frac{2}{\sqrt{5}} = \frac{2}{\sqrt{5}} * \frac{\sqrt{5}}{\sqrt{5}} = \frac{2\sqrt{5}}{5}$

4. $\sqrt{5} * \sqrt{5} = 5$

Simplifying Radical Expressions

Simplify: $9\sqrt{32} + \sqrt{2}$

$= 9\sqrt{2*2*2*2*2} + \sqrt{2}$

$= 9*2*2\sqrt{2} + \sqrt{2}$

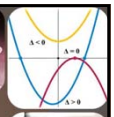
$= 36\sqrt{2} + \sqrt{2}$

$= 37\sqrt{2}$

No Perfect Squares
No Fractions in Radicand
No Radicals in Denominator
Treat the Radical like a Variable

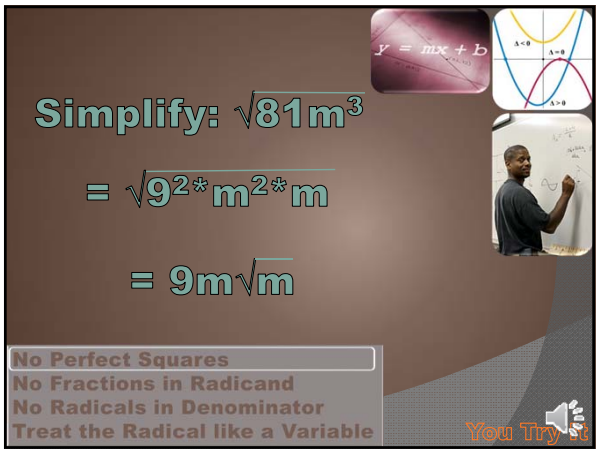
Simplifying Radical Expressions

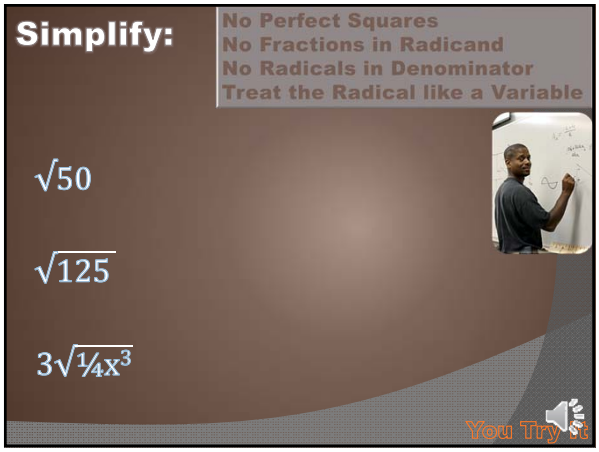
Simplify: $\sqrt{81m^3}$

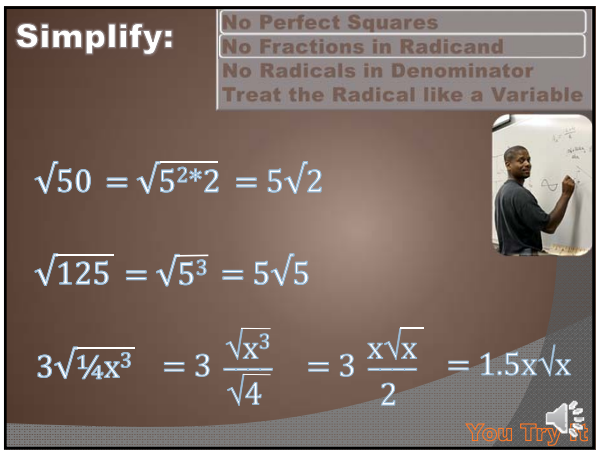


No Perfect Squares
No Fractions in Radicand
No Radicals in Denominator
Treat the Radical like a Variable

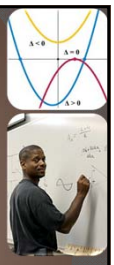
You Try It:


Simplify: $\sqrt{81m^3}$
$= \sqrt{9^2 * m^2 * m}$
$= 9m\sqrt{m}$
No Perfect Squares
No Fractions in Radicand
No Radicals in Denominator
Treat the Radical like a Variable
You Try It:


Simplify:
No Perfect Squares
No Fractions in Radicand
No Radicals in Denominator
Treat the Radical like a Variable
$\sqrt{50}$
$\sqrt{125}$
$3\sqrt{¼x^3}$
You Try It:


Simplify:
No Perfect Squares
No Fractions in Radicand
No Radicals in Denominator
Treat the Radical like a Variable
$\sqrt{50} = \sqrt{5^2 * 2} = 5\sqrt{2}$
$\sqrt{125} = \sqrt{5^3} = 5\sqrt{5}$
$3\sqrt{¼x^3} = 3\frac{\sqrt{x^3}}{\sqrt{4}} = 3\frac{x\sqrt{x}}{2} = 1.5x\sqrt{x}$
You Try It:

Simplify: $\frac{1}{\sqrt{3z}}$

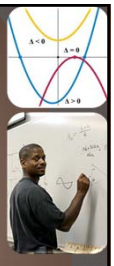


No Perfect Squares
No Fractions in Radicand
No Radicals in Denominator
Treat the Radical like a Variable

You Try It!

Simplify: $\frac{1}{\sqrt{3z}}$

$* \frac{\sqrt{3z}}{\sqrt{3z}} = \frac{\sqrt{3z}}{3z}$



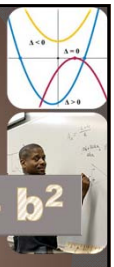
No Perfect Squares
No Fractions in Radicand
No Radicals in Denominator
Treat the Radical like a Variable

You Try It!

Simplify:

$\frac{\sqrt{10}}{7 - \sqrt{2}}$

$(a + b)(a - b) = a^2 - b^2$



No Perfect Squares
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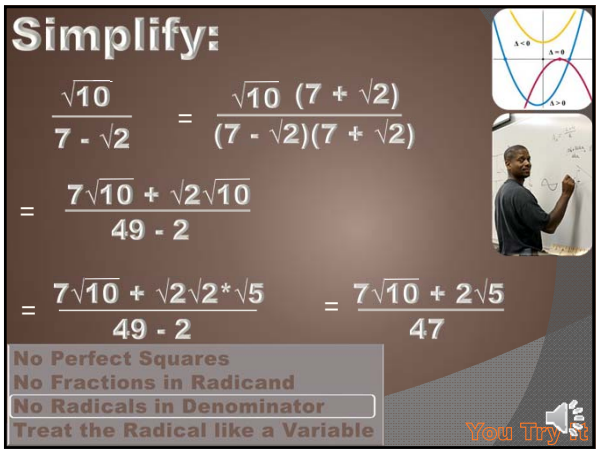
Treat the Radical like a Variable

You Try It!


Simplify:
$\frac{\sqrt{10}}{7-\sqrt{2}} = \frac{\sqrt{10}\,(7+\sqrt{2})}{(7-\sqrt{2})(7+\sqrt{2})}$
$= \frac{7\sqrt{10}+\sqrt{2}\sqrt{10}}{49-2}$
$= \frac{7\sqrt{10}+\sqrt{2}\sqrt{2}*\sqrt{5}}{49-2} = \frac{7\sqrt{10}+2\sqrt{5}}{47}$
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