

## Multiplying with More Than One Term and Rationalizing Denominators

### Multiplying Radical Expressions with More Than One Term

**Ex 1.**

Multiply:

$$\sqrt[3]{x}(\sqrt[3]{x^2} - \sqrt[3]{7}) =$$

$$(6\sqrt{5} + 3\sqrt{2})(2\sqrt{5} - 4\sqrt{2}) =$$

$$(\sqrt{6} + \sqrt{5})(\sqrt{6} - \sqrt{5}) =$$

$$(\sqrt{xy} - \sqrt{b})(\sqrt{xy} + \sqrt{b}) =$$

### Rationalizing Denominators Containing One Term

**Ex 2.**

Rationalize the denominator (that is, make the bottom of the fraction a rational #):

$$\frac{\sqrt{3}}{\sqrt{7}} =$$

$$\sqrt[3]{\frac{2}{9}} =$$

$$\sqrt{\frac{2x}{7y}} =$$

$$\frac{\sqrt[3]{x}}{\sqrt[3]{9y}} =$$

$$\frac{6x}{\sqrt[5]{8x^2y^4}} =$$

### Rationalizing Denominators Containing Two Terms

#### Ex 3.

Rationalize the denominator:

$$\frac{18}{2\sqrt{3}+3} =$$

$$\frac{2+\sqrt{5}}{\sqrt{6}-\sqrt{3}} =$$

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**Practice**

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1. Multiply:

a)  $\sqrt{6}(4\sqrt{6} - 3\sqrt{2})$

b)  $\sqrt[3]{x}(\sqrt[3]{24x^2} - \sqrt[3]{x})$

c)  $(3\sqrt{5} - 2\sqrt{3})(4\sqrt{5} + 5\sqrt{3})$

d)  $(\sqrt{2} + \sqrt{7})^2$

e)  $(\sqrt[3]{x} - 3)(\sqrt[3]{x} + 7)$

2. Rationalize the denominator:

a)  $\frac{\sqrt{7}}{\sqrt{3}}$

b)  $\sqrt[3]{\frac{3}{4}}$

c)  $\frac{10}{\sqrt[3]{4x^2}}$

$$d) \sqrt[3]{\frac{3}{xy^2}}$$

$$e) \frac{3xy^2}{\sqrt[5]{8xy^3}}$$

$$f) -\sqrt{\frac{150a^3}{b^5}} \text{ (For this one, simplify first, then rationalize)}$$

$$g) \frac{15}{\sqrt{6}+1}$$

$$h) \frac{\sqrt{11}-\sqrt{5}}{\sqrt{11}+\sqrt{5}}$$

$$i) \frac{\sqrt{x}-2}{\sqrt{x}-5}$$

Q: What runs but never walks, has a mouth but never talks?