

Warm-Up:

Simplify.

$$1) (\sqrt{x+3})^2 = |x+3|$$

$$2) \sqrt{(x+3)^2} = |x+3|$$

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

$$4) \sqrt{3} \cdot \sqrt{12} = \sqrt{36} = 6$$

$$16) \sqrt{(-18)^2} = 18$$

Section 7-5: Operations with Radical Expressions

Recall that a radical may be split across multiplication and division.

$$\sqrt{49a} = \sqrt{49} \cdot \sqrt{a}$$

$7\sqrt{a}$

$$\sqrt{\frac{a}{49}} = \frac{\sqrt{a}}{\sqrt{49}}$$

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

A radical expression is fully simplified when:

- the n is as small as possible
- the radicand (number under the radical) contains no factors that are n th powers of an integer or polynomial
- the radicand has no fractions
- no radicals are in the denominator

Examples:

Simplify.

$$1) \sqrt{25a^4b^9} = \sqrt{25a^4b^8} \sqrt{b}$$
$$5a^2b^4 \sqrt{b}$$

$$2) \sqrt{\frac{y^8}{x^7}} = \frac{\sqrt{y^8}}{\sqrt{x^6} \sqrt{x}} = \frac{y^4}{x^3 \sqrt{x}} \frac{\sqrt{x}}{\sqrt{x}} = \frac{y^4 \sqrt{x}}{x^4}$$

$$3) \sqrt[3]{\frac{2}{9x}} = \frac{\sqrt[3]{3x^2}}{\sqrt[3]{3x^2}} = \frac{\sqrt[3]{6x^2}}{\sqrt[3]{27x^3}} = \frac{\sqrt[3]{6x^2}}{3x}$$

Examples:

Simplify.

$$4) 5 \sqrt[3]{100a^2} \cdot \sqrt[3]{10a}$$

$$5 \sqrt[3]{1000a^3}$$

$$5 \cdot 10a$$

$$50a$$

Homework: pg. 413-414 #18-35 all, 56, 57, 62

~~Section 7.5 Vocab~~

$$f(x) = x + 4 \quad g(x) = x^2 - 9$$

$$(f+g)(x) = x^2 + x - 5$$

$$\left(\frac{f}{g}\right)(x) = \frac{x+4}{x^2-9} \quad x \neq 3, -3$$

$$(f \circ g)(x) = (x^2 - 9) + 4 = x^2 - 5$$

$$f(x) = \{(2, 5), (3, 6), (-2, 1)\}$$

$$g(x) = \{(8, 2), (6, -2), (-9, 3)\}$$

$$(f \circ g)(x) = \{(8, 5), (6, 1), (-9, 6)\}$$

