

~~Warm Up.~~ $y =$ (function notation)

Given that $f(x) = 2x + 1$, find $g(x)$ if

$$g(x) = 2[f(x)]^2 - 1.$$

$$2(2x+1)^2 - 1$$

$$2(4x^2 + 4x + 1) - 1$$

$$8x^2 + 8x + 2 - 1$$

$$8x^2 + 8x + 1$$

PEMDAS

$$(2x+1)(2x+1)$$

$$4x^2 + 2x + 2x + 1$$



Simplifying Radicals

List some numeric and variable perfect squares below.

$$2 \cdot 2 = 4$$

$$3 \cdot 3 = 9$$

$$4 \cdot 4 = 16$$

$$5 \cdot 5 = 25$$

$$8 \cdot 8 = 64$$

$$x \cdot x = x^2$$

$$x^2 \cdot x^2 = x^4$$

$$x^3 \cdot x^3 = x^6$$

$$x^4 \cdot x^4 = x^8$$

$$x^5 \cdot x^5 = x^{10}$$

exponent is
a multiple
of 2
(even)

RULE: $\sqrt{a \cdot b} = \sqrt{a} \cdot \sqrt{b}$

Example:

$$\sqrt{450}$$

① $\sqrt{25 \cdot 18}$

$$5\sqrt{18}$$

$$5\sqrt{9 \cdot 2}$$

$$5 \cdot 3\sqrt{2}$$

$$15\sqrt{2}$$

② $\sqrt{225 \cdot 2}$

$$15\sqrt{2}$$

③ $\sqrt{9 \cdot 50}$

$$3\sqrt{50}$$

$$3\sqrt{25 \cdot 2}$$

$$3 \cdot 5\sqrt{2}$$

$$15\sqrt{2}$$

simplest radical form- When a Square Root has no perfect square factors in Radicand

radicand- part underneath Radical

$\sqrt{4x^2}$ ← Radicand

Write the radicals in simplest form:



$$3\sqrt{18x^3}$$

$$3\sqrt{9 \cdot 2} \sqrt{x^2 \cdot x}$$

$$3 \cdot 3x \sqrt{2x}$$

$$9x\sqrt{2x}$$

$$\sqrt{\frac{9x^2}{4y^6}}$$

$$\frac{\sqrt{9} \sqrt{x^2}}{\sqrt{4} \sqrt{y^6}}$$

$$\frac{3x}{2y^3}$$

$$\sqrt{8a^3b^5}$$

$$\sqrt{4} \sqrt{a^2} \sqrt{a} \sqrt{b^4} \sqrt{b}$$

$$2ab^2 \sqrt{2ab}$$

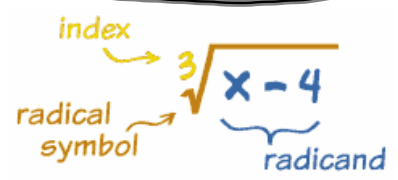
$$\frac{\sqrt{a^3}}{a\sqrt{a}} \quad \frac{\sqrt{b^5}}{b^2\sqrt{b}}$$

What is the inverse of squaring a number? Square Root $\sqrt{\quad}$

So what would be the inverse of cubing a number? Cube Root $\sqrt[3]{\quad}$

What about the inverse of raising a number to the 4th power? 4th Root $\sqrt[4]{\quad}$

index- Root being taken
in a Radical



Cube root of "x-4"

More Examples:

$$\sqrt[3]{16a^4b^3}$$

$$2\sqrt[3]{16a^3b^4c^5}$$

$$\sqrt[3]{54a^7b^4}$$

$$\sqrt[3]{\frac{a^6b^9}{-64}}$$

$$\sqrt[5]{-243a^6b^{12}}$$

Extra Cuberoot Practice:

Work in small groups to complete the worksheet

HW: p. 93-94 #1, 10-45 multiples of 5

Writing About Mathematics

1. Explain the difference between $-\sqrt{36}$ and $\sqrt{-36}$.

Developing Skills

In 3–38, write each radical in simplest radical form. Variables in the radicand of an even index are non-negative. Variables occurring in the denominator of a fraction are non-zero.

10. $4\sqrt{363x^5y^7}$ 15. $\sqrt[3]{375x^5y^6}$ 20. $\sqrt{\frac{a^5}{2}}$ 25. $\sqrt{\frac{5a}{18}}$ 30. $\sqrt{0.08}$ 35. $\sqrt{300c}$

Applying Skills

40. The length of one leg of an isosceles right triangle is 6 inches. Express the length of the hypotenuse in simplest radical form.
45. The area of a triangle is $\sqrt[5]{243x^5y^{10}}$ square units. If the length of a side of the triangle is $\sqrt[5]{x^5}$, express the length of the altitude to that side in simplest radical form.