

Lesson 5.2- Simplifying Radicals.notebook

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Lesson 5.2- SWBAT simplify numerical radicals.

Kick off- Simplify each of the following:

- 1) $\sqrt{175}$
- 2) $\sqrt{36}$
- 3) Find $f^{-1}(x)$ when $f(x) = 3x + 2$
- 4) Find $f^{-1}(x)$ when $f(x) = \frac{1}{2}x - 1$

Simplifying Numerical Radicals:

$$\begin{aligned} \sqrt{175} &= \sqrt{25 \cdot 7} \\ &= 5\sqrt{7} \end{aligned}$$

$$\begin{aligned} \sqrt{36} &= \sqrt{6^2} \\ &= 6 \end{aligned}$$

$$\begin{aligned} f^{-1}(x) &= 3x + 2 \\ x &= 3y + 2 \\ x - 2 &= 3y \\ \frac{x-2}{3} &= y \end{aligned}$$

$$\begin{aligned} f^{-1}(x) &= \frac{x-2}{3} \\ f^{-1}(x) &= \frac{1}{3}(x-2) \end{aligned}$$

Perfect Squares:

$$1, 4, 9, 16, 25, 36, 49, 64, 81, 100$$

To Simplify a Radical (Simplest Radical Form)

- 1) Find the factors of the inside number and one of the factors must be a perfect square.
- 2) Split the inside numbers into two different radicals
- 3) The perfect square first and then the other factor.
- 4) Take the square root of the perfect square and if there is a number on the outside multiply it to the number.

Examples: Put each of the following in simplest radical form.

- 1) $\sqrt{24}$
- 2) $\sqrt{4 \cdot 6}$
- 3) $\sqrt{40}$
- 4) $\sqrt{36}$

$$\begin{aligned} \sqrt{24} &= \sqrt{4 \cdot 6} \\ &= 2\sqrt{6} \end{aligned}$$

$$\begin{aligned} \sqrt{4 \cdot 6} &= \sqrt{4} \cdot \sqrt{6} \\ &= 2\sqrt{6} \end{aligned}$$

$$\begin{aligned} \sqrt{40} &= \sqrt{4 \cdot 10} \\ &= 2\sqrt{10} \end{aligned}$$

$$\begin{aligned} \sqrt{36} &= \sqrt{6^2} \\ &= 6 \end{aligned}$$

5) $2\sqrt{99}$

6) $2\sqrt{28}$

Homework:

- 1) $3\sqrt{2}$
- 2) $5\sqrt{6}$
- 3) 4
- 4) $4\sqrt{6}$
- 5) $2\sqrt{2}$
- 6) $2\sqrt{5}$
- 7) $8\sqrt{5}$
- 8) $7\sqrt{2}$

7) Simplify: $\sqrt{64}$

8) Find $f^{-1}(x)$ when $f(x) = \frac{5}{3}x + 2$

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

10) Find $f^{-1}(x)$ when $f(x) = -6x + 1$

Process for Inverse Functions:

- ① Change $f(x)$ to y
- ② Switch x and y
- ③ Solve for y
- ④ Change y to $f^{-1}(x)$

11) Find $f^{-1}(x)$ when $f(x) = 4x + 7$

12) Simplify: $3\sqrt{50}$

13) Find $f^{-1}(x)$ when $f(x) = -\frac{1}{3}x - 5$

14) Simplify: $5\sqrt{40}$

15) Simplify: $4\sqrt{9}$

16) Find $f^{-1}(x)$ when $f(x) = -2x + 6$

17) Simplify: $3\sqrt{175}$

18) Simplify: $\sqrt{125}$

19) Simplify: $4\sqrt{200}$

20) Find $f^{-1}(x)$ when $f(x) = x + 2$