

Monday, Sept. 20, 2021

Review of Simplifying Radicals

Consider problem #5

5)  $\sqrt{72}$

What question are you asking yourself to simplify any radical expression?

Note:  $\sqrt[2]{72} \neq \sqrt[3]{72} \neq \sqrt[5]{72}$

5)  $\sqrt{72} = \sqrt[2]{72}$  (Note: The index is a “2”, or square root when it is not shown within the radical symbol)

What question are you asking yourself to simplify any radical expression?

**Question:** What number **multiplied by itself**  $n$  (*index*) **times**, gives you the product (radicand =  $x$ ) under the radical?

$$\sqrt[n]{x}$$

## Examples:

a)  $\sqrt[3]{64} \rightarrow$

"what number multiplied by itself 3 times equals 64"

b)  $\sqrt[4]{625} \rightarrow$

"what number multiplied by itself 4 times equals 625"

c)  $\sqrt[5]{32} \rightarrow$

"what number multiplied by itself 5 times equals 32"

Note:  $\sqrt[2]{72} \neq \sqrt[3]{72} \neq \sqrt[5]{72}$

Is the radicand a *perfect square* or **perfect cube** or etc.?

5)  $\sqrt{72} = \sqrt[2]{72} = \sqrt{36 \cdot 2} = 6\sqrt{2}$

8)  $\sqrt{27} = \sqrt{3 \cdot 3 \cdot 3} = \sqrt{3^2 \cdot 3} = 3\sqrt{3}$

15)  $2\sqrt{20} + 3\sqrt{5} =$

$$2\sqrt{4 \cdot 5} = 2\sqrt{4}\sqrt{5} = 4\sqrt{5}$$

$$4\sqrt{5} + 3\sqrt{5} = 7\sqrt{5}$$

12)  $3\sqrt{5} \cdot 2\sqrt{10} = 6\sqrt{50}$

$$6\sqrt{2 \cdot 25} = 6 \cdot 5\sqrt{2} = 30\sqrt{2}$$

$$a\sqrt{b} \cdot c\sqrt{d} = ac\sqrt{bd}$$

$a\sqrt{b} + c\sqrt{d} =$  cannot be combined unless you can

Simplify either  $\sqrt{b}$  or  $\sqrt{d}$

$$3\sqrt{24} + 5\sqrt{6} =$$

$$3\sqrt{4}\sqrt{6} = 6\sqrt{6}$$

$$6\sqrt{6} + 5\sqrt{6} = 11\sqrt{6}$$