

Roots & powers

* When Solving equations of any type, we always use opposite operations to isolate the variable

for example:

Addition \rightarrow opposite \rightarrow Subtraction
 Multiplication \rightarrow opp. \rightarrow Division.

§ now

Square root (\sqrt{x}) is the opposite of Squaring a variable (x^2)

$$\text{So } \sqrt{x^2} = x$$

If you wanted to get rid

$$\text{of } x^2 \Rightarrow \sqrt{x^2} = x$$

* Taking the Square root of a Square gets rid of the Square.

Ex 1. Solve for x
 $\sqrt{x} = 6$

$\sqrt{x^2}$ and $\sqrt{x^2} = x$

Ex. ~~$\sqrt{x} = 6^2$~~
 $x = 6^2$
 $x = 36$

* Important *

- when you solve for a variable such as x, you always add or subtract first!!

Ex 2

~~$\sqrt{x^2} = \sqrt{49}$~~
 $x = \sqrt{49}$
 $x = 7$

* we have to "undo" the x^2 term.

Ex 3

~~$\sqrt{x^2} = 5^2$~~
 $x = 25$

Ex 4

~~$\sqrt{x^2} = \sqrt{5}$~~
 $x = \sqrt{5}$

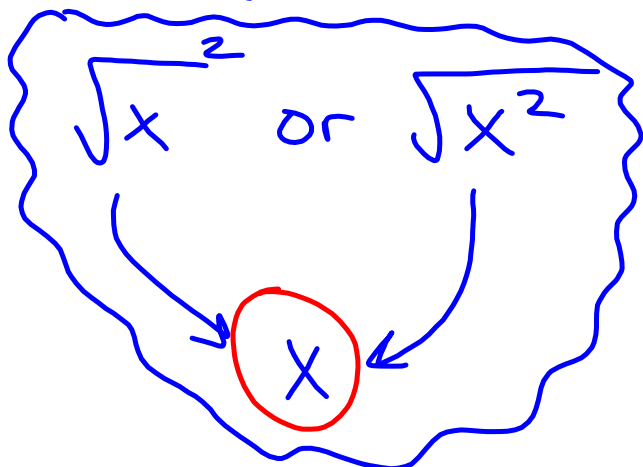
Ex 5

Solving $x^2 + 4 = 20$
 $\downarrow -4 \quad -4$

 ~~$\sqrt{x^2} = \sqrt{16}$~~
 $x = \sqrt{16} = 4$

Ex

$$\sqrt{x^2} = 10^2$$



$$\sqrt{x} = x^{1/2}$$

$$x^2 = x^2$$

$$\Rightarrow \frac{1}{2} \cdot \frac{2}{1} = \frac{2}{2} = 1$$

Ex

$$\sqrt{x} - 10 = 4$$

$$\begin{array}{r} \sqrt{x} - 10 = 4 \\ +10 \quad +10 \\ \hline \star \sqrt{x^2} = 14^2 \end{array}$$

$$x = 14^2 = 196$$

* Always add or subtract first when solving for x.