

Solving Equations with Radicals - Part 1

Recall: $\sqrt{x^2} = x$ and $(\sqrt{x})^2 = x$

Example 1:

Solve

a.) $\sqrt{x} = 10$

To solve for x , we square both sides

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

$$x = 100$$

b.) $\sqrt{x+1} = 7$

Square both sides

$$(\sqrt{x+1})^2 = (7)^2$$

$$x+1 = 49$$

Subtract **1**

$$x = 48$$

c.) $\sqrt{2x+1} = \sqrt{3x-5}$

Square both sides

$$2x+1 = 3x-5$$

Subtract **2x**

$$1 = x-5$$

Add **5**

$$6 = x$$

d.) $\sqrt{10x+15} = 5\sqrt{x}$

$$\sqrt{10x+15} = 5\sqrt{x}$$

Square both sides

$$10x+15 = 25x$$

Subtract **10x**

$$15 = 15x$$

Divide by **15**

$$1 = x$$

e.) $\sqrt{x} - 5 = 2$

We can start by squaring both sides, but it would take a lot of steps. Instead we opt to isolate the \sqrt{x} , THEN square both sides.

$$\sqrt{x} - 5 = 2$$

Add **5**

$$\sqrt{x} = 7$$

Square both sides

$$x = 49$$

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Practice Problems

Solve:

1. $\sqrt{x} = 12$

2. $\sqrt{x-1} = 6$

3. $\sqrt{4x-1} = \sqrt{3x+4}$

4. $4\sqrt{x} = \sqrt{20x-16}$