

Solving Radicals - Notes

Steps:

- 1) Get radical by itself
- 2) Square or cube both sides
- 3) Solve for x.
- 4) Check your answers!!!

* You will have some that don't work *

$$\begin{aligned} 1. \quad \sqrt[3]{x} - 4 &= 0 \\ &+4 \quad +4 \\ (\sqrt[3]{x})^3 &= 4^3 \\ x &= 64 \end{aligned}$$

$$\begin{aligned} \text{Check} \\ \sqrt[3]{64} - 4 &= 0 \\ 4 - 4 &= 0 \\ &\checkmark \end{aligned}$$

$$\begin{aligned} 2. \quad \sqrt{4x-7} + 2 &= 5 \\ &-2 \quad -2 \\ (\sqrt{4x-7})^2 &= 3^2 \\ 4x-7 &= 9 \\ &+7 \quad +7 \\ 4x &= 16 \\ x &= 4 \end{aligned}$$

$$\begin{aligned} \text{Check} \\ \sqrt{4(4)-7} + 2 &= 5 \\ \sqrt{16-7} + 2 &= 5 \\ \sqrt{9} + 2 &= 5 \\ 3 + 2 &= 5 \\ &\checkmark \end{aligned}$$

$$\begin{aligned} 3. \quad \sqrt{3x+2} - 2\sqrt{x} &= 0 \\ &+2\sqrt{x} \quad +2\sqrt{x} \\ (\sqrt{3x+2})^2 &= (2\sqrt{x})^2 \\ 3x+2 &= 4x \\ -3x \quad -3x & \\ 2 &= x \end{aligned}$$

$$\begin{aligned} \text{Check} \\ \sqrt{3(2)+2} - 2\sqrt{2} &= 0 \\ \sqrt{8} - 2\sqrt{2} &= 0 \\ 2\sqrt{2} - 2\sqrt{2} &= 0 \\ &\checkmark \end{aligned}$$

$$4. (\sqrt{2x})^2 = (x-4)^2$$

$$2x = (x-4)(x-4)$$

$$2x = x^2 - 8x + 16$$

$$\begin{array}{r} -2x \quad -2x \\ 2x = x^2 - 8x + 16 \end{array}$$

$$0 = x^2 - 10x + 16$$

$$0 = (x-8)(x-2)$$

$$x = 8 \quad x = 2$$

Check !!

$$\boxed{8}$$

$$\sqrt{2(8)} = 8-4$$

$$\sqrt{16} = 4$$

✓

$$\boxed{2}$$

$$\sqrt{2(2)} = 2-4$$

$$\sqrt{4} = -2$$

X

* 2 is an EXtraneous solution *

* You can NOT have a radical = negative #

$$\sqrt{2x} \neq -2$$

$$5. ((2x+5)^{1/2})^2 = 4^2$$

$$2x+5 = 16$$

$$\begin{array}{r} -5 \quad -5 \\ 2x+5 = 16 \end{array}$$

$$\frac{2x}{2} = \frac{11}{2}$$

$$x = \frac{11}{2}$$

Check

$$\left(2\left(\frac{11}{2}\right) + 5\right)^{1/2} = 4$$

$$(11+5)^{1/2} = 4$$

$$16^{1/2} = 4$$

✓

* For all checking, plug answer into calculator to check! I showed work by hand but your calculator does it too!! *