

Solving Radical Equations

Wednesday, February 26, 2020

3:26 PM

We did this already in chp 3

① Square both sides of the equation
to get rid of roots

② Solve the quadratic (Factor / Quad Form)

③ Check answers (Extraneous Roots)

extra → not real answers

$$5x - 5 \\ (5)^2 = (-5)^2$$

Ex 1 Solve

$$a) (\sqrt{x+5})^2 = (x-1)^2 = (x-1)(x-1)$$

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

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

$$0 = x^2 - 3x - 4$$

Quad Form
 $ax^2 + bx + c = 0$

Factor

$$\begin{array}{r|l} (x-4) & (1, -4) \\ (x+1) & -3 \end{array}$$

$$0 = (x+1)(x-4)$$

$$x = -1, 4$$

Quad Form

$$x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(1)(-4)}}{2(1)}$$

$$x = \frac{3 \pm \sqrt{9+16}}{2}$$

$$x = \frac{3 \pm 5}{2} = 4, -1$$

Check: $x=4$

$$\sqrt{(4)+5} = 4-1$$

$$\sqrt{9} = 3$$

$$3 = 3 \checkmark$$

Check: $x=-1$

$$\sqrt{(-1)+5} = -1-1$$

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

$$2 \neq -2$$

b) $\sqrt{7x-17} + x = 1$

$$(\sqrt{7x-17})^2 = (1-x)^2$$

$$7x-17 = 1 - 2x + x^2$$

$$0 = x^2 - 9x + 18$$

$$\begin{array}{r|l} \textcircled{\times} 8 & (-3, 6) \\ \textcircled{\oplus} -9 & -9 \end{array}$$

$$0 = (x-3)(x-6)$$

$$x = +3, +6$$

Check: $x=3$

$$\sqrt{7(3)-17} + 3 = 1$$

$$\sqrt{21-17} + 3 = 1$$

$$\sqrt{4} + 3 = 1$$

$$2 + 3 = 1$$

$$5 \neq 1$$

Check: $x=6$

$$\sqrt{7(6)-17} + 6 = 1$$

$$\sqrt{42-17} + 6 = 1$$

$$\sqrt{25} + 6 = 1$$

$$5 + 6 = 1$$

$$11 \neq 1$$

No
answers
none