

Day 2 Homework: Solving Radical Equations

Solve the following for x using the notes from the video! You may work with your peers. Be sure to check for extraneous solutions! Show all your work on a separate sheet of paper.

1. $\sqrt{x+2} + 2 = 5$

$$\sqrt{x+2} = 3$$

$$x+2 = 9$$

$$x = 7 \checkmark$$

extraneous
solution

2. $\sqrt{x+4} + 2 = x$

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

$$x+4 = x^2 + 4x + 4$$

$$0 = x^2 + 3x$$

$$0 = x(x+3)$$

$$x = 0, -3$$

	x	2
x	x^2	$2x$
2	$2x$	4

NO
Solution

3. $\sqrt{x^2+9} = -5$
 $x^2+9 = 25$
 $x^2 = 16$ $x=4$ ✓

4. $\sqrt{x+16}^2 = (x+4)^2$
 $x+16 = x^2+8x+16$
 $0 = x^2+7x$ $x=0$ ✓
 $0 = x(x+7)$ $x=-7$

5. $\sqrt{2x+1} = 3$
 $2x+1 = 9$
 $2x = 8$
 $x=4$ ✓

6. $\sqrt{x+3} = 2x$
 $x+3 = 4x^2$
 $0 = 4x^2-x-3$ $x=3/4$
 $0 = (4x+3)(x-1)$

7. $\sqrt{8x+1} - 2x = x - 4$
 $(\sqrt{8x+1})^2 = (3x-4)^2$
 $8x+1 = 9x^2-24x+16$
 $9x^2-32x+15=0$ $x=3$ ✓
 $(9x-5)(x-3)=0$ $x=5/9$

8. $\sqrt{x+4} + 2 = -x$ $0 = x(x+2)$
 $\sqrt{x+4}^2 = (-x-2)^2$ $x=0$
 $x+4 = x^2+4x+4$ $x=-3$ NO Solution

9. $\sqrt[3]{x^3-2} = \sqrt[3]{x^2+4x-6}$ $x=1$ ✓
 $x^3-2 = x^2+4x-6$ $x=2$ ✓
 $0 = x^3-x^2-4x+4$ $x=-2$ ✓
 $0 = (x^2-4)(x-1)$

10. $\sqrt{3x^2-2} = (x+2)$
 $3x^2-2 = x^2+4x+4$
 $2x^2-4x-6=0$ $x=3$ ✓
 $2(x-3)(x+1)=0$ $x=-1$ ✓

11. $(\sqrt{2x^3+2})^2 = (x+1)^2$ $x=1/2$ ✓
 $2x^3+2 = x^2+2x+1$ $x=1$ ✓
 $2x^3-x^2+2x+1=0$ $x=-1$ ✓
 $(x^2-1)(2x-1)=0$

12. $\sqrt{8x+1} - 2x = x - 4$
 SKIP

13. The number of people, y , involved in recycling in a community is modeled by the function $y = 90\sqrt{3x+400}$, where x is the number of months the recycling plant has been open.

(a) Find the number of people involved in recycling exactly 3 months after the plant opened.

670

(b) After how many months will 940 people be involved in recycling?

12 months

USE Table