

Name:

Period:

Date:

Solving Radical Equations

Solve each equation. Check your answers for extraneous solutions.

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

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

$$2x+1 = 16$$

$$2x = 15$$

$$x = 15/2$$

2. $\sqrt{x^2 - 9} + 3 = 7$

3. $(x - 2)^{1/3} - 3 = -5$

$$(x-2)^{1/3} = -2$$

$$x-2 = -8$$

$$x = -6$$

4. $10 - 3\sqrt[3]{2x+5} = -11$

5. $(x^2 - x - 22)^{4/3} = 16$ $4\sqrt[4]{16^3}$

$$x^2 - x - 22 = 16^{3/4}$$

$$x^2 - x - 22 = 8$$

$$x^2 - x - 30 = 0$$

$$(x+5)(x-6) \quad x = -5, 6$$

6. $3(x - 5)^{3/2} - 6 = 18$

7. $\sqrt{2x-6} = \sqrt{5x-15}$

$$2x-6 = 5x-15$$

$$9 = 3x$$

$$x = 3$$

8. $\sqrt[3]{6x-5} - \sqrt[3]{3x+2} = 0$

9. $\sqrt{3x+7} = x+1$

$$3x+7 = x^2 + 2x + 1$$

$$0 = x^2 - x - 6$$

$$(x+2)(x-3)$$

$$x = \cancel{2}, 3$$

$$\sqrt{-6+7} = -2+1$$

$$\sqrt{1} = -1x$$

$$\sqrt{9+7} = 3+1$$

$$\sqrt{16} = 4 \checkmark$$

10. $(\sqrt{x+3})^2 = (\sqrt{x+4})^2$

$$x+9 + 6\sqrt{x} = x+4$$

$$6\sqrt{x} = -5$$

$$36x = 25$$

$$x = \cancel{\frac{25}{36}}$$

	$\sqrt{x} + 3$	
\sqrt{x}	x	$3\sqrt{x}$
3	$3\sqrt{x}$	9

No Solution

11. $\sqrt{x+3} = 1 + \sqrt{x+1}$

$$x+3 = x+2 + 2\sqrt{x+1}$$

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

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

$$1 = 4x+4$$

$$x = -\frac{3}{4}$$

	1	$\sqrt{x+1}$
$\sqrt{x+1}$	1	$\sqrt{x+1}$
	$\sqrt{x+1}$	$x+1$

12. $\sqrt{x+8} = \sqrt{x} + \sqrt{3}$

$$x+8 = x+3 + 2\sqrt{3x}$$

$$5 = 2\sqrt{3x}$$

$$25 = 4 \cdot 3x$$

$$25 = 12x$$

$$x = \frac{25}{12}$$

	\sqrt{x}	$\sqrt{3}$
\sqrt{x}	x	$\sqrt{3x}$
$\sqrt{3}$	$\sqrt{3x}$	3