

7.5 Solving Square Root and Other Radical Equations PART 2

Pull

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Examples

Isolate the radical on one side of the equal sign.

Pull

$$\sqrt{x+42} = (x)^2$$

$$x+42 = x^2 \quad \text{get everything to one side}$$

$$x^2 - x - 42 = 0$$

for extraneous root

Square both sides of the equation.

Pull

$$(x-7)(x+6) = 0$$

$x = 7$	$x = -6$
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$\checkmark \sqrt{7+42} = 7$ | $\sqrt{-6+42} = 6$ Check your solutions
 $x = 7$ | $\sqrt{36} \neq -6$ extraneous solution

pull for answer

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Examples

$$\sqrt{30-2x} + 3 = x$$

Isolate the radical on one side of the equal sign.

Pull

$$(\sqrt{30-2x})^2 = (x-3)^2 \quad (x-3)(x-3)$$

$$30-2x = x^2-6x+9$$

Square both sides of the equation.

Pull

$$0 = x^2-4x-21$$

$$\frac{(x-7)(x+3)}{x=7 \quad | \quad x=-3}$$

ck for extraneous root

$x = 7$

pull for answer

$$\sqrt{30-2(7)} + 3 = 7$$

$$\sqrt{16} + 3 = 7$$

$$4 + 3 = 7$$

$$\sqrt{30-2(-3)} + 3 = -3$$

$$\sqrt{36} + 3 = -3$$

$$6 + 3 = 9 \neq -3$$

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Examples

$$\sqrt{3x+6} + 4 = x$$

Pull

$$3x+6 = (x-4)^2$$

$$3x+6 = x^2-8x+16$$

$$= x^2-11x+10$$

ck for extraneous root

$x = 10$

pull for answer

Pull

$$\frac{(x-10)(x-1)}{x=10 \quad | \quad x=1}$$

$$\sqrt{3+6} + 4 = 1$$

$$\sqrt{9} + 4 = 1$$

$$3 + 4 \neq 1$$

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2

Examples

$$\frac{2(x-1)^{\frac{2}{3}}}{2} = \frac{18}{2}$$

Isolate the parenthesis...how?
 $\div 2$

Pull

$$\left((x-1)^{\frac{2}{3}} \right)^{\frac{3}{2}} = (9)^{\frac{3}{2}}$$

$$\left(\sqrt[3]{(x-1)^2} \right)^3 = (\sqrt{9})^3$$

What do you need to multiply 2/3 by in order to get 1?

Pull

$$x-1 = (\sqrt{9})^3$$

$$x-1 = (\pm 3)^3$$

✓ $x = 28, -26$

$$x-1 = 27 \quad x-1 = -27$$

$$x = 28 \quad x = -26$$

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Examples

$$(x-5)^{\frac{3}{2}} - 18 = 46$$

Isolate the parenthesis...how?
 $+18$

Pull

$$\frac{(x-5)^{\frac{3}{2}}}{2} = \frac{64}{2}$$

What do you need to multiply 3/2 by in order to get 1?

Pull

$$x-5 = (\sqrt[3]{64})^2$$

$\sqrt[3]{\quad}$ means no \pm

$$x-5 = 16$$

$$x = 21$$

✓ $x = 21$

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Examples

Isolate the
parenthesis...how?

$$-8 \div 2$$

Pull

$$2(x-5)^{\frac{4}{3}} + 8 = 40$$

Pull



$$x = 13, -3$$

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#7-12, 15-20, 39, 40

Solve.

7. $(x+5)^2 = 4$

9. $3(x-2)^{\frac{3}{4}} = 24$

11. $(x+1)^{\frac{3}{2}} - 2 = 25$

8. $(x-2)^{\frac{2}{3}} = 9$

10. $3(x+3)^{\frac{3}{4}} = 81$

12. $3 + (4-x)^{\frac{3}{2}} = 11$

Solve. Check for extraneous solutions.

15. $\sqrt{11x+3} - 2x = 0$

17. $\sqrt{3x+13} - 5 = x$

19. $(x+3)^{\frac{1}{2}} - 1 = x$

16. $(5x+4)^{\frac{1}{2}} - 3x = 0$

18. $\sqrt{x+7} + 5 = x$

20. $(5-x)^{\frac{1}{2}} = x+1$

39. $(2x+3)^{\frac{3}{4}} - 3 = 5$

40. $2(x-1)^{\frac{4}{3}} + 4 = 36$

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