

Solving Radical Equations

Solve: $\sqrt{5n - 4} - 9 = 0.$

$$(\sqrt{5n - 4})^2 = (9)^2$$

$$5n - 4 = 81$$

$$\frac{5n}{5} = \frac{85}{5}$$

$$\boxed{n = 17}$$

$$x^2 = 9$$

$$(\sqrt{x})^2 = (6)^2$$

Solve: $\sqrt{3m+2} - 5 = 0.$

$$(\sqrt{3m+2})^2 = (5)^2$$

$$3m+2=25$$

$$3m=23$$

$$m = \frac{23}{3}$$

Solve: $\sqrt{9k-2} + 1 = 0.$

$$(\sqrt{9k-2})^2 = (-1)^2$$

$$\begin{array}{r} 9k-2 = 1 \\ +2 \quad +2 \end{array}$$

$$9k = 3$$

$$~~k = \frac{1}{3}~~ \text{ No Solution}$$

$$\sqrt{9k-2} = -1$$

Solve: $\sqrt{7s - 3} + 2 = 0.$

$$\sqrt{7s - 3} = -2$$

$$7s - 3 = 4$$

$$7s = 7$$

$$\cancel{s = 1}$$

No Solution

Solve: $\sqrt{p-1} + 1 = p.$

$$(p-1)(p-1)$$

$$\sqrt{p-1}^2 = (p-1)^2$$

$$p-1 = p^2 - 2p + 1$$

$$-p + 1 \quad -p + 1$$

$$-2 \cdot -1$$

$$0 = p^2 - 3p + 2$$

$$(p-2)(p-1)$$

$$p-2=0 \quad p-1=0$$

$$p=2$$

$$p=1$$

Solve: $\sqrt{y-5} + 5 = y$.

$$(\sqrt{y-5})^2 = (y-5)^2$$

$$y-5 = y^2 - 10y + 25$$

$$0 = y^2 - 11y + 30$$

$$(y-5)(y-6)$$

$$y=5 \quad y=6$$

Solve: $\sqrt[3]{5x+1} + 8 = 4.$

$$\left(\sqrt[3]{5x+1}\right)^3 = (-4)^3$$

$$5x+1 = -64$$

$$5x = -65$$

$$x = -13$$

Solve: $\sqrt[3]{6x - 10} + 1 = -3$

$$\left(\sqrt[3]{6x - 10}\right)^3 = (-4)^3$$

$$6x - 10 = -64$$

$$6x = -54$$

$$x = -9$$

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

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

$$\left(\sqrt[4]{3x-2}\right)^4 = (2)^4$$

$$3x-2 = 16$$

$$3x = 18$$

$$x = 6$$

Solve: $(9x + 9)^{\frac{1}{4}} - 2 = 1.$

$$\left(\sqrt[4]{9x+9}\right)^4 = (3)^4$$

$$9x+9 = 81$$

$$9x = 72$$

$$x = 8$$

Solve: $\sqrt{r+4} - r + 2 = 0$.

$$(\sqrt{r+4})^2 = (r-2)^2$$

$$r+4 = r^2 - 4r + 4$$

$$0 = r^2 - 5r$$

$$r(r-5) = 0$$

$$\cancel{r=0} \quad r=5$$

Solve: $\sqrt{m+9} - m + 3 = 0.$

$$(\sqrt{m+9})^2 = (m-3)^2$$

$$m+9 = m^2 - 6m + 9$$

$$0 = m^2 - 7m$$

$$0 = m(m-7)$$

$$m \neq 0 \quad m = 7$$

Solve: $3\sqrt{3x-5} - 8 = 4.$

$$3\sqrt{3x-5} = \frac{12}{3}$$

$$(\sqrt{3x-5})^2 = (4)^2$$

$$3x-5 = 16$$

$$3x = 21$$

$$x = 7$$

Solve: $2\sqrt{4a+4} - 16 = 16$.

$$2\sqrt{4a+4} = 32$$

$$\sqrt{4a+4} = 16$$

$$4a+4 = 256$$

$$4a = 252$$

$$a = 63$$

Solve: $\left(\sqrt[3]{4x - 3}\right)^3 = \left(\sqrt[3]{3x + 2}\right)^3$

$$4x - 3 = 3x + 2$$

$$x - 3 = 2$$

$$x = 5$$

Solve: $(\sqrt[3]{7x+1})^3 = (\sqrt[3]{2x-5})^3$

$$7x+1 = 2x-5$$

$$5x+1 = -5$$

$$5x = -6$$

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

293, 295, 297
299, 305-313 odd
319, 321