

RADICAL EQUATIONS

Must check if sides to both raised to even power.

$$4\sqrt[3]{2p+7} - 5 = 7$$

$$\cancel{4}\sqrt[3]{2p+7} = \frac{12}{\cancel{4}}$$

$$(\sqrt[3]{2p+7})^3 = (3)^3$$

$$2p+7=27$$

$$2p=20$$

$$\boxed{p=10}$$

$$\sqrt{6p-3} + 9 = 7$$

$$(\sqrt{6p-3})^2 = (-2)^2$$

$$6p-3 = 4$$

$$6p = 7$$

$$\cancel{p = \frac{7}{6}}$$

No solution

$$\sqrt{\cancel{6} \cdot \frac{7}{\cancel{6}} - 3} + 9 = 7$$

$$\sqrt{4} + 9 = 7$$

$$2 + 9 = 7$$

$$\sqrt{2x-5} + \sqrt{x-11} = 7$$

$$(\sqrt{2x-5})^2 = (7 - \sqrt{x-11})^2 \quad \leftarrow \text{FOIL!}$$

$$= (7 - \sqrt{x-11})(7 - \sqrt{x-11})$$

$$1^2 + 2^2 = 3^2$$

$$1 + 4 \neq 9$$

$$2x-5 = 49 - 7\sqrt{x-11} - 7\sqrt{x-11} + x-11 \quad \text{Combine like terms!}$$

$$\begin{array}{r} 2x-5 \\ -2x+5 \end{array} = \begin{array}{r} 38+x \\ +5-2x \end{array} - 14\sqrt{x-11}$$

$$[14\sqrt{x-11}]^2 = [43-x]^2 \quad \leftarrow \text{FOIL!}$$

$$(43-x)(43-x)$$

$$196(x-11) = 1849 - 43x - 43x + x^2$$

$$196x - 2156 = x^2 - 86x + 1849$$

$$-196x + 2156$$

$$0 = x^2 - 282x + 4005$$

$$\frac{282 \pm \sqrt{282^2 - 4(1)(4005)}}{2(1)}$$

$$\sqrt{2x-5} + \sqrt{x-11} = 7$$

$$x = 267$$

$$\sqrt{529} + \sqrt{256} = 7$$

$$23 + 16 \neq 7$$

$$x = 15$$

$$\sqrt{25} + \sqrt{4} = 7$$

$$5 + 2 = 7 \checkmark$$

$$x = \cancel{267}, 15$$

SOLVING WITH RATIONAL EXPONENTS

$$x^{5/2} + 7 = 39$$

$$(\sqrt[2]{x^5})^2 = (32)^2$$

$$\sqrt[5]{x^5} = \sqrt[5]{1024}$$

$$\boxed{x = 4}$$

Check

$$4^{5/2} + 7 = 39$$

$$32 + 7 = 39 \checkmark$$

$$x^{5/2} + 7 = 39$$

$$(x^{5/2})^{2/5} = (32)^{2/5}$$

$$x = \sqrt[5]{32^2}$$

$$= 2^2$$

$$x = 4$$

even
check

$$x^{2/5} + 3x^{1/5} = 28$$

$$x^{2/5} + 3x^{1/5} - 28 = 0$$

$$(x^{1/5} + 7)(x^{1/5} - 4) = 0$$

$$x^{1/5} + 7 = 0 \quad x^{1/5} - 4 = 0$$

$$(x^{1/5})^5 = (-7)^5 \quad (x^{1/5})^5 = (4)^5$$

$$\boxed{x = -16807 \quad x = 1024}$$