

6.5 Solving Power Functions

A. Reverse order of ops:

Add/Subtract --> Multiply/Divide --> Exponents Last

CAUTION

- ~ Extraneous solutions may occur when you raise both sides to an even power.
- ~ Extraneous solutions are solutions that you mathematically arrive at, but ultimately do not solve the equation.

CAUTION

- ~ Don't forget plus or minus when you raise both side to something over an even power.

B. Examples ~ Solve.

#1

$$\sqrt[3]{x-1} = 3$$

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

$$x-1 = 27$$

$$x = 28$$

#2

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

$$x-3 = (x-5)^2$$

$$x-3 = x^2 - 10x + 25 \quad x=7$$

$$0 = x^2 - 11x + 28$$

$$0 = (x-7)(x-4)$$

$$x = 7, 4$$

4 is extraneous

#3

$$2x^4 + 3 = 165$$

$$\frac{-3 \quad -3}{\hline}$$

$$\frac{\sqrt[4]{x^4} = 162}{2} \quad \frac{\sqrt[4]{\quad}}{2}$$

$$x^{\frac{4}{4}} = 81^{\frac{1}{4}} = \sqrt[4]{81}$$

$$x = \pm 3$$

even #