

## 15.4 – Equations Containing Rational Exponents

1. Isolate the term containing the rational exponent.
2. Raise both sides to a power that is the reciprocal of the power in the problem.
3. Solve for  $x$ .
4. Write the solution.

Examples:

1.  $x^{\frac{4}{3}} = 16$

$$\left(x^{\frac{4}{3}}\right)^{\frac{3}{4}} = 16^{\frac{3}{4}}$$

$$x = (\sqrt[4]{16})^3$$

$$x = 2^3$$

$$x = 8$$

2.  $(3x)^{\frac{1}{2}} - 6 = 0$

$$(3x)^{\frac{1}{2}} = 6$$

$$\left[(3x)^{\frac{1}{2}}\right]^2 = 6^2$$

$$3x = 36$$

$$x = 12$$

3.  $(x - 1)^{\frac{2}{3}} = 8$

$$\left[(x - 1)^{\frac{2}{3}}\right]^{\frac{3}{2}} = 8^{\frac{3}{2}}$$

$$x - 1 = (\sqrt[3]{8})^2$$

$$x - 1 = 4$$

$$x = 5$$

solution:  $x = 5$

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

$$(2x + 4)^{\frac{2}{3}} = 4$$

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

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

$$2x + 4 = 8$$

$$2x = 4$$

$$x = 2$$

solution:  $x = 2$