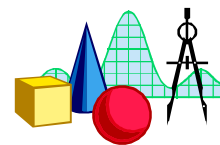




# MATH DEPT. TUTORIAL 5



## Tutorial 5: Law of exponents: square roots, radicals, nth roots, rationalizing.

1. Evaluate each of the following

(a)  $\sqrt[3]{64}$

(b)  $\sqrt[3]{-216}$

(c)  $(81)^{3/4}$

(d)  $\sqrt[3]{\frac{27}{8}}$

(e)  $(\frac{16}{81})^{-3/4}$

(f)  $\sqrt[4]{(562)^4}$

2. Remove all possible factors from the radical.

(a)  $\sqrt[3]{\frac{16}{27}}$

(b)  $\sqrt{54xy^2}$  ( $x > 0, y > 0$ )

(c)  $\sqrt[5]{96x^5}$

(d)  $\sqrt{\frac{18x^2}{z^3}}$  ( $x > 0, z > 0$ )

(e)  $\sqrt[3]{72x^3}$

3. Rationalize the denominator. Then simplify if possible.

(a)  $\frac{5}{\sqrt{10}}$

(b)  $\frac{8}{\sqrt[3]{2}}$

(c)  $\frac{2x}{5 - \sqrt{3}}$

(d)  $\frac{3}{\sqrt{5} - \sqrt{6}}$

4. Rationalize the numerator. Then simplify if possible.

(a)  $\frac{\sqrt{8}}{4}$

(b)  $\frac{1 + \sqrt{3}}{1 - \sqrt{3}}$

(c)  $\frac{\sqrt[3]{4}}{6}$

(d)  $\frac{\sqrt{x} + 1}{x^2 - 1}$

5. Change from radical to exponential form.

(a)  $\sqrt[4]{3^2}$

(b)  $\sqrt[6]{(x+2)^4}$

(c)  $\sqrt{\sqrt{32}}$

(d)  $\sqrt[4]{2x}$

6. Simplify.

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

(b)  $4\sqrt{27} - \sqrt{75}$

(c)  $-2\sqrt{9y} + 10\sqrt{y}$

(d)  $5^{4/3} 5^{8/3}$

(e)  $\frac{(2x^2)^{3/2}}{\sqrt{2} x^4}$

(f)  $\frac{x^{4/3} y^{2/3}}{(xy)^{1/3}}$