MATH 112

Review of Exponents

1. $x^a \cdot x^b = x^{a+b}$

   Examples:

   (a) $x^2 \cdot x^3 = x^5$

   (b) $x^4(5x^3 + 2x^7) = 5x^7 + 2x^{11}$

2. $\dfrac{x^a}{x^b} = x^{a-b}$

   Examples:

   (a) $\dfrac{x^2}{x^{1/2}} = x^{3/2}$

   (b) $\dfrac{5x^3 + 2x^7}{x^4} = \dfrac{5x^3}{x^4} + \dfrac{2x^7}{x^4} = 5x^{-1} + 2x^3$

3. $\dfrac{b}{cx^a} = \dfrac{b}{c} \cdot x^{-a}$

   Examples:

   (a) $\dfrac{1}{x} = x^{-1}$

   (b) $\dfrac{4}{x^2} = 4x^{-2}$

   (c) $\dfrac{3}{x^{1/3}} = 3x^{-1/3}$

   (d) $\dfrac{1}{4x} = \dfrac{1}{4}x^{-1}$

   (e) $\dfrac{3}{5x^2} = \dfrac{3}{5}x^{-2}$

4. $\sqrt[b]{x^a} = x^{a/b}$ (SPECIAL NOTATION: $\sqrt{x} = x^{1/2}$)

   (a) $\sqrt[3]{x^2} = x^{2/3}$

   (b) $\sqrt[7]{x^9} = x^{9/7}$

   (c) $\dfrac{1}{\sqrt{x}} = \dfrac{1}{x^{1/2}} = x^{-1/2}$

   (d) $\dfrac{3}{11\sqrt[4]{x}} = \dfrac{3}{11x^{1/4}} = \dfrac{3}{11}x^{-1/4}$