METHODS AND MEANINGS

MATH NOTES

Negative and Fractional Exponents

For all x not equal to zero:

$x^0 = 1$ Examples: $2^0 = 1$, $(-3)^0 = 1$, $\left(\frac{1}{4}\right)^0 = 1$

For positive values of x :

$x^{-n} = \frac{1}{x^n}$ Examples: $x^{-3} = \frac{1}{x^3}$, $y^{-4} = \frac{1}{y^4}$, $4^{-2} = \frac{1}{4^2} = \frac{1}{16}$

$\frac{1}{x^{-n}} = x^n$ Examples: $\frac{1}{x^{-5}} = x^5$, $\frac{1}{x^{-2}} = x^2$, $\frac{1}{3^{-2}} = 3^2 = 9$

$x^{a/b} = (x^a)^{1/b} = \sqrt[b]{x^a}$ or $x^{a/b} = (x^{1/b})^a = (\sqrt[b]{x})^a$

Examples: $5^{1/2} = \sqrt{5}$, $3^{2/3} = \sqrt[3]{3^2} = \sqrt[3]{9}$,

$16^{3/4} = (16^{1/4})^3 = (\sqrt[4]{16})^3 = 2^3 = 8$