Zero and Negative Exponents
NOTE: When simplifying final answers should not have negative exponents unless the direction ask for negative exponents!

1) Simplify:

a) $6^0 = 1$

b) $4x^0 y^{-2} = \dfrac{4}{y^2}$

c) $-5x^{-4}$ $\dfrac{-5}{x^4}$

d) $\dfrac{2}{3}x^{-6}$ $\dfrac{2}{3x^6}$

e) $\dfrac{1}{4^{-3}} = 4^3 = 64$

2) Evaluate when $a = 2, b = -1, c = -3$

a) $4a^2 b^0 = 16$

b) $5a^{-3} = \dfrac{5}{a^3} = \dfrac{5}{8}$

c) $\dfrac{6c^2}{b^{-1}} = 6c^2 b^1 = -54$

d) $-2a^{-3} b^{-2} = \dfrac{-2}{a^3 b^2} = -\dfrac{1}{4}$

Simplify $a^n \cdot a^{-n}$. What is the mathematical relationship of a^n and a^{-n}? Justify your answer.

$\dfrac{a^n}{a^n} =$ Reciprocals Same value will equal 1

Are $3x^{-2}$ and $3x^2$ reciprocals? Explain.

$\dfrac{3}{x^2}$ and $3x^2$ No. $3x^2$ Reciprocal $\rightarrow \dfrac{1}{3x^2}$

$\dfrac{3}{x^2}$ Reciprocal $\rightarrow \dfrac{x^2}{3}$

Choose a fraction to use as a value for the variable a. Find the values of a^{-1}, a^2, and a^{-2}.

$\left(\dfrac{1}{2}\right)^{-1} = 2$ $\left(\dfrac{1}{2}\right)^2 = \dfrac{1}{4}$ $\left(\dfrac{1}{2}\right)^{-2} = 4$