

8.3 Zero & Negative Exponents

Zero Exponent Rule

a^0 = Means have same exponent on top & bottom
So the answer is 1

So $5^0 = 1$
 $(-3)^0 = 1$

$$\frac{7^2}{7^2} = \frac{\quad}{\quad} =$$

or $= 7$

Negative Exponents

a^{-n}
 $\frac{a}{1} = \frac{1}{a^n}$ = Need to move so exponent is positive

$\frac{1}{a^{-n}} = a^n$

$$\frac{5^2}{5^8} = \frac{5 \cdot 5}{5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot 5} = \frac{1}{5^6} \text{ or } 5^{-6} \quad \left\{ 5^{2-8} = \frac{5^{-6}}{1} \right.$$

$$\frac{9^4}{9} = \frac{9^3}{1} = 9^3 \text{ or } 9^{4-1} \left\{ \right.$$

Σ examples

$$\textcircled{1} (4^{-2})^2$$

-4 ← move to bottom

$$= 4$$

$$= \frac{1}{4^4}$$

$$\textcircled{2} \left(\frac{5^{-1}}{5^{-2}} \right) = \frac{5^2}{5^{-1}}$$

* make everything happy

$$= \frac{5^{-1}}{1} = 5^{-1}$$

$$\textcircled{3} (2^1 \cdot x^1 \cdot y^{-5})^3$$

$$= 2^3 \cdot x^3 \cdot y^{-15}$$

$$= \frac{2^3 \cdot x^3}{y^{15}}$$

$$\textcircled{4} 3x^{-2}y^{-5}$$

$$\frac{3}{x^2 y^5}$$