

Do Now: Simplify

a)  $4^{\square} \cdot 4^3 = 4^{13}$

(Find the value of  $\square$ )

$\boxed{10}$

c)  $x^4 \div x^4 = x^0 = \boxed{1}$

b)  $(-4xy^3)^2 = \boxed{16x^2y^6}$   $(-4)^2$

d)  $\frac{1}{4^2} = \boxed{\frac{1}{16}}$

**AIM: Laws of Negative Exponents**

→ Flip

1)  $x^2 \div x^6 = x^{-4} = \boxed{\frac{1}{x^4}}$

2)  $\frac{4^{-2}}{1} = \frac{1}{4^2} = \boxed{\frac{1}{16}}$

3)  $5^{-2} = \frac{1}{5^2} = \boxed{\frac{1}{25}}$

4)  $2^{-3} = \frac{1}{2^3} = \boxed{\frac{1}{8}}$

5)  $y^{-3} = \boxed{\frac{1}{y^3}}$

6)  $3(3^{-2})$   
↓  
 $3(\frac{1}{3^2})$   
 $3(\frac{1}{9}) = \boxed{\frac{1}{3}}$

7)  $(\frac{1}{2})^{-3} = (\frac{2}{1})^3 = \boxed{8}$

**Rule: Negative Exponent: Flip & make the exponent (+)**

8)  $7^0 + 10 = 1 + 10 = \boxed{11}$

9)  $-3x^0$   
 $-3(1) = \boxed{-3}$

10)  $(-3x)^0 = \boxed{1}$

11)  $8^0 + 3^{-3} = 1 + \frac{1}{27} = \boxed{\frac{28}{27}}$

What is any non-zero number raised to the zero exponent?

1

12)  $5x^{-3}y^8z^{-1}$   
 $\frac{5}{1} \left(\frac{1}{x^3}\right) \left(\frac{y^8}{1}\right) \left(\frac{1}{z}\right)$   
 $= \frac{5y^8}{x^3z}$

13)  $-(18xy)^0 w^{-8} z^3$   
 $\frac{-1z^3}{w^8}$

14)  $\frac{a^2b^3c^4}{a^5b^2c^4}$   
 $a^{-3}b^1c^0 = \frac{b}{a^3}$

15)  $3a^2b^{-5}c^{-7} \cdot -2a^4b^3c^{-3}$   
 $-6a^6b^{-2}c^{-10} = \frac{-6a^6}{b^2c^{10}}$

RULE: (+) Exponent: go in numerator (top)  
 (-) Exponent: go in denominator (bottom)  
 + make exponent (+)

Directions: Fill in the box. Coefficients always go in numerator.

16)  $(4d^3)^{-3} = \frac{1}{64d^9}$

17)  $(x^3y^{-1})^{-3} = \frac{y^3}{x^9}$   
 $x^{-9}y^3$

EXIT CARD

Directions- On a separate sheet of paper answer the following questions SHOW ALL WORK :

18)  $5c^{-3}d^{-6}e^2 \cdot -2c^4d^2e^{-2}$   
 $-10c^1d^{-4}e^0 = \frac{-10c}{d^4}$

19)  $\frac{-30x^2y^{-5}z^4}{-15x^5y^4z^2}$   
 $2x^{-3}y^{-9}z^2 = \frac{2z^2}{x^3y^9}$