

# **Zero Exponent**

• When anything, except 0, is raised to the zero power it is 1.

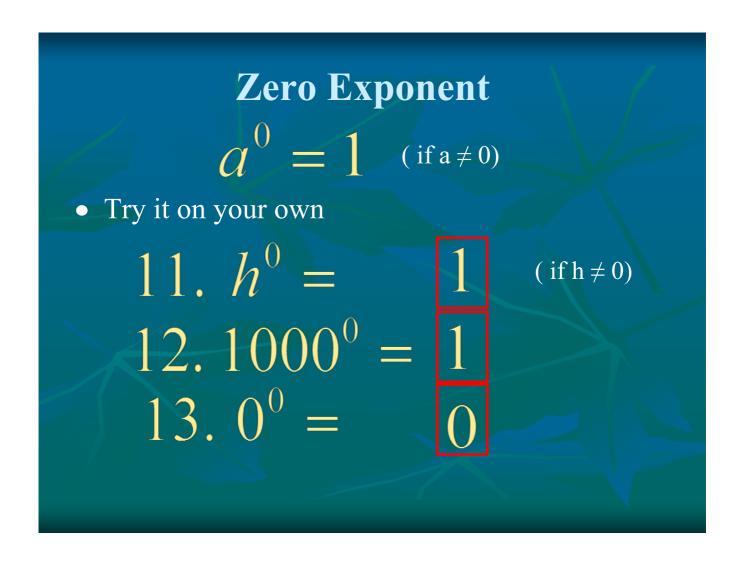
$$a^0 = 1 \quad (\text{if a} \neq 0)$$

• For example

$$x^0 = 1 \quad (if x \neq 0)$$

$$25^0 = 1$$

$$(-1)^{\circ} = |$$
 $-|^{\circ} = -|$ 
 $-|^{\circ} = -|$ 



# Negative Exponents • If b \neq 0, then $b^{-n} = \frac{1}{b^n}$ • For example $\frac{1}{x^2} = \frac{1}{x^2}$ $3^{-2} = \frac{1}{3^2} = \frac{1}{9}$

# Negative Exponents • If b \neq 0, then $b^{-n} = \frac{1}{b^n}$ • Try it on your own: $14. \ h^{-3} = \frac{1}{h^3}$ $15. \ 2^{-3} = \frac{1}{2^3} = \frac{1}{8}$

## **Negative Exponents**

• The negative exponent basically flips the part with the negative exponent to the other half of the fraction.

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

$$\left(2\right) \left(2x^2\right)$$

$$\left(\frac{2}{x^{-2}}\right) = \left(\frac{2x^2}{1}\right) = 2x^2 \quad \frac{2}{1} \times \frac{1}{x^2}$$

### **Math Manners**

• For a problem to be completely simplified there should not be any negative exponents

### Try these:

1. 
$$(2a^2b)^0 =$$

2. 
$$y^2 \times y^{-4} =$$

3. 
$$(a^5)^{-1} =$$

4. 
$$s^{-2} \times 4s^7 =$$

$$5.(3x^{-2}y^3)^{-4} =$$

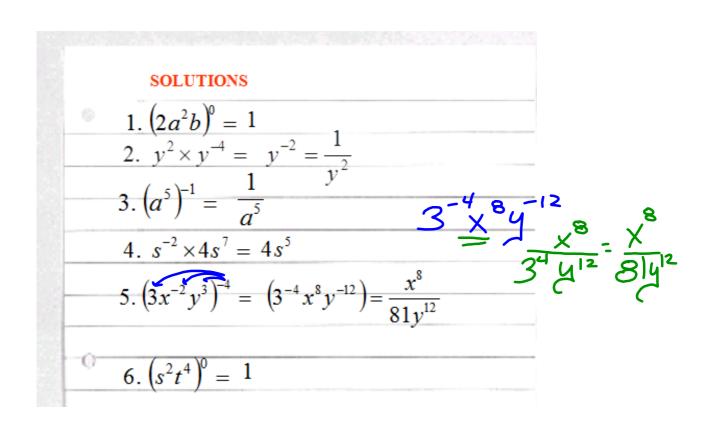
6. 
$$(s^2t^4)^0 =$$

7. 
$$\left(\frac{2^2}{x}\right)^{-1}$$

7. 
$$\left(\frac{2^2}{x}\right)^{-1} =$$
8.  $\left(\frac{3^9}{3^5}\right)^{-2} =$ 

9. 
$$\left(\frac{s^2t^2}{s^4t^4}\right)^{-2} =$$

10. 
$$\left(\frac{36a^5}{4a^4b^5}\right)^{-2} =$$



### SOLUTIONS

7. 
$$\left(\frac{2^2}{x}\right)^{-1} = \frac{x}{4}$$

8. 
$$\left(\frac{3^9}{3^5}\right)^{-2} = \left(3^4\right)^{-2} = 3^{-8} = \frac{1}{3^8}$$

9. 
$$\left(\frac{s^2t^2}{s^4t^4}\right)^{-2} = \left(s^{-2}t^{-2}\right)^{-2} = s^4t^4$$

9. 
$$\left(\frac{s^{2}t^{2}}{s^{4}t^{4}}\right)^{-2} = \left(s^{-2}t^{-2}\right)^{-2} = s^{4}t^{4}$$
10. 
$$\left(\frac{36a^{5}}{4a^{4}b^{5}}\right)^{-2} = \frac{9^{-2}a^{-2}b^{10}}{81a^{2}} = \frac{b^{10}}{81a^{2}}$$

$$\left(\frac{90}{b^{5}}\right)^{-2} = \frac{9^{-2}a^{-2}b^{10}}{81a^{2}} = \frac{b^{10}}{9^{2}0^{2}} = \frac{b^{10}}{9^$$

a) 
$$\lambda^{-4} = \frac{1}{2^{4}} = \frac{1}{16}$$
d)  $3z^{-2} = \frac{3}{z^{2}}$ 
b)  $4^{-2} = \frac{1}{4^{2}} = \frac{1}{16}$ 
e)  $\frac{1}{3^{2}} = 3^{2} = 9$ 
c)  $x^{-6} = \frac{1}{x^{6}}$ 

7. 
$$2^{-5} \cdot 2^{3} = 2^{-2} = \frac{1}{2^{2}} = \frac{1}{4}$$
  
8.  $x^{3} \cdot x^{-7} = x^{-4} = \frac{1}{x^{4}}$   
9.  $3^{3} = 3^{-2} = \frac{1}{3^{2}} = \frac{1}{9}$ 

$$|0. \frac{x^{4}}{x^{-6}}| = x^{10} \qquad 4 - 6$$

$$|1. x^{0}| = |1$$

$$|12. |1001|^{-1} = \frac{1}{1001}$$