10.4

Zero and Negative Exponents

Do Now

Simplify.

1) $h^2 \cdot h^4$

2) $z \cdot z^{12}$

3) $\left(y^2\right)^4$

4) $\left(x^2 y^3\right)^3$

5) $\left(5a^8\right)^2$

6) $\frac{x^8}{x^3}$

7) $\frac{a^9 b}{a^2}$

Understanding Zero Exponents

Use the pattern to find the zero exponent result:

	Simplified Exponent	Evaluate
$\frac{2^6}{2^2}$		
$\frac{2^6}{2^3}$		
$\frac{2^6}{2^4}$		
$\frac{2^6}{2^5}$		
$\frac{2^6}{2^6}$		

Zero Exponent Rule

Any number to the zero power equals to _____.

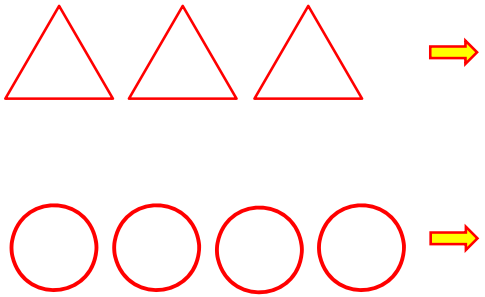
a) 4^0

b) 17^0

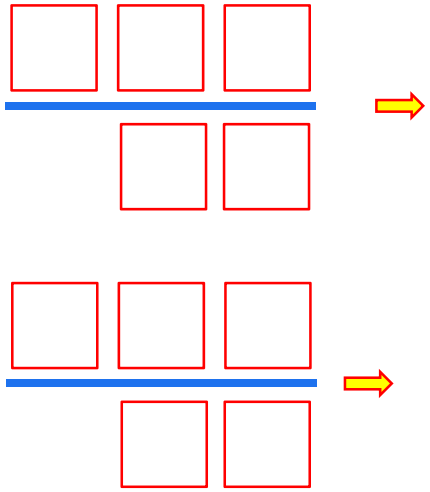
c) 125^0

d) $5{,}785{,}123^0$

Understanding: Gathering and Cancelling Activity



Understanding: Gathering and Cancelling Activity



Understanding: Gathering and Cancelling Activity

Gather and cancel as much as possible. ***(Order of shapes doesn't matter)***

1) □□□□□△△△○○○○

2) 3 △△○4○○2 6

3) 5 4 2 7 3 □

4) 2 4 ○ 7

Understanding: Gathering and Cancelling Activity

Gather and cancel as much as possible. ***(Order of shapes doesn't matter)***

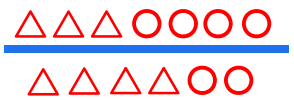
5) $\frac{\square\square\square\square\square\triangle\triangle\triangle\bigcirc\bigcirc\bigcirc\bigcirc}{\square\square\triangle\triangle\triangle\bigcirc\bigcirc}$

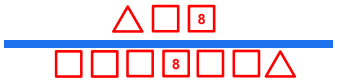
6) $\frac{\square\square\triangle\triangle\triangle\triangle\triangle\triangle\bigcirc\bigcirc\bigcirc\bigcirc\bigcirc}{\triangle\triangle\triangle\triangle\bigcirc\bigcirc}$

7) $\frac{\square\square\square\square\triangle\triangle\triangle\triangle\bigcirc\bigcirc}{\square\triangle\bigcirc\bigcirc\square\square\square}$

Understanding: Gathering and Cancelling Activity

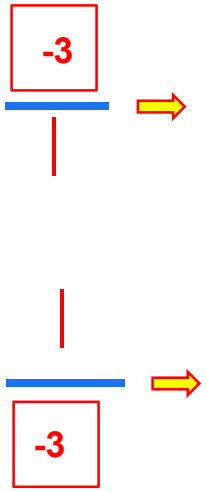
Gather and cancel as much as possible. ***(Order of shapes doesn't matter)***

8) 

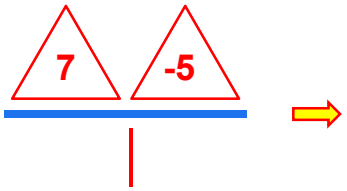
9) 

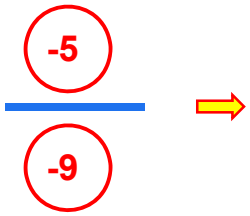
10) 

Understanding: Gathering and Cancelling Activity



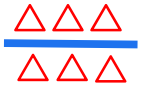
Understanding: Gathering and Cancelling Activity





Understanding: Gathering and Cancelling Activity

Gather and cancel as much as possible. ***(Order of shapes doesn't matter)***

11) 

12) 

13) 

Understanding: Gathering and Cancelling Activity

Gather and cancel as much as possible. ***(Order of shapes doesn't matter)***

14) 

15) 

13) 

10-4 Define and Use Zero and Neg. Exponents

Use the pattern to find zero exponent and negative exponents results:

2^4	
2^3	
2^2	
2^1	
2^0	
2^{-1}	
2^{-2}	
2^{-3}	

RULES:

- ANY number to the zero power equals _____.
- a^{-n} is the _____ of a^n.

Evaluate

1) 4^{-2}

2) 8^0

3) $(-24)^0$

4) 2^{-3}

5) $\dfrac{1}{2^{-4}}$

6) $(-5)^{-3}$

Practice

Simplify

1) 10^{-3}

2) $(-2)^{-6}$

3) 7^0

4) $\dfrac{1}{5^{-4}}$

5) $10^{-5} \bullet 10^{7}$