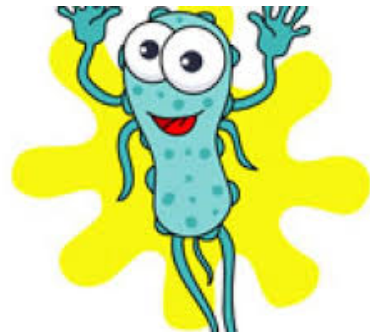


Date: _____

Bell Work



1. Write $(-3x)^4$ in expanded form.
2. Solve question 1.
3. The population of bacteria in a sample doubles every hour. The initial population is 12.
 - a) Complete the following table to model the bacterial growth.

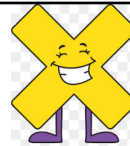
Hours	Expanded Form	Exponent Form	Number of Bacteria
0	12×1	$12(2)^0$	12
1	12×2	$12(2)^1$	24
2	$12 \times 2 \times 2$	$12(2)^2$	
3	$12 \times 2 \times 2 \times 2$		

- b) How many bacteria will there be after 8 hours?

Submit your work in PDF format on Edsby.

Monday, October 7, 2019

3.3 Discover the Exponent Laws



1) The Product Rule

What operation is occurring when we use the word 'product'?

Write $3^6 \times 3^4$ in expanded form.

How could we write this expanded form as a single power?

How could we write a single power without writing both powers in expanded form?

Product Rule:

When multiplying powers of the same base, add the exponents.

$$a^b \times a^c = a^{b+c}$$

Practice Problems:

Write each of the following as a single power, if possible. If you cannot, explain why.

1. $(-2)^4(-2)^3$

2. $2^4 \times (-2)^5$

3. $(\frac{1}{2})^3(\frac{1}{2})^{11}$

4. y^7y^4

5. x^2y^3

6. $(2x)^2(3x)^2$

2) The Quotient Rule

What operation is occurring when we use the word 'quotient'?

Write $\frac{3^{10}}{3^6}$ in expanded form. Cancel out the values that appear in both the top and bottom to write a single power.

What do you notice? How can we write as a single power without writing in expanded form first?

Quotient Rule

When dividing powers with the same base, subtract exponents.

$$a^b \div a^c = a^{b-c}$$



Practice Problems:

Write each of the following as a single power, if possible. If you cannot, explain why.

1. $(-2)^7 \div (-2)^3$

2. $(-2)^4(-2)^5 \div (-2)^6$

3. $(\frac{1}{2})^{15} \div (-\frac{1}{2})^{11}$

4. $\frac{y^7 y^1}{y^4}$

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

6. $\frac{12x^6}{4x^4}$

3) The Power of a Power Rule

Write $(2^3)^2$ in expanded form. Remember that you need to first expand inside the brackets, and then apply repeated multiplication.

What would this expanded form look like as a single power? How could we get there without expanding?

Practice Problems:

Simplify as much as possible by applying the exponent laws.

1. $[(-2)^4]^3$

2. $(3^2)(3^4)^3 \div (3^3)^2$

3. $[(\frac{1}{2})^3]^{11}$

4. $(y^3)^3$

5. $(x^2 y^3)^{10}$

6. $(2x^3)^2(3y^3)^2$

