Exponents Day 2

Agenda

Warm-Up

HW Check

Notes (p.89)

HW #1-14

Reminders

Bathroom Passes Due Thurs

Quiz Friday

Warm-Up Tuesday

1. If $y = x^5$, what is equivalent to x^{20}?

A. y^{100} B. y^{25}

C. y^{15} D. y^4

2. Evaluate the x^{sun} for $s = 2$, $u = 5$, $n = -4$

$x^{2(5)(-4)} = x^{-40} = \boxed{\frac{1}{x^{40}}}$

Questions, Comments, Concerns?

Algebra I – Unit 7: Topic 1 – Integer Exponents

Practice – Integer Exponents **pp 446-448**

Name _____ Date _____ Period _____

Simplify the expressions below.

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

2. $(-5)^{-2}$

3. $\frac{1}{2^0}$

4. $\left(\frac{1}{4}\right)^2 = \left(\frac{1}{4}\right)\left(\frac{1}{4}\right) = \frac{1}{16}$

5. -5^2

6. $\frac{4}{2^{-3}}$

Simplified expressions are shown below. Fill in the box with the value that makes each equation true.

7. $4n^{\square} = \frac{4}{n^2}$

8. $\frac{a^{\square}}{3b^{\square}} = \frac{ab^3}{3}$

In the lab, the population of a certain bacteria doubles every month. A study uses the expression $3000 \bullet 2^m$ to model a population of 3000 bacteria after m months of growth.

9. What is the population of bacteria at the beginning of the study when m=0?

10. What is the population of bacteria at m=-2? What does this value represent?

Evaluate each expression for x=-3 and y=5.

11. $3y^{-2}$

12. $(4x)^{-2}$

13. $\frac{1}{x^{-3}y^2}$

14. x^0y^{-3}

Simplify each expression.

15. $a^{-5}b^{-7}$ $\boxed{\frac{1}{a^5b^7}}$

16. a^1c^0

17. $\frac{7ab^{-2}}{3w}$ $\frac{7a}{b^2(3)w}$ $\boxed{\frac{7a}{3b^2w}}$

18. $\frac{15s}{5t^{-3}}$ $= \frac{15st^3}{5}$ $= 3st^3$

Product of Powers

multiply

$$x^3 \bullet x^2$$

$$x \cdot x \cdot x \cdot x \cdot x = \boxed{x^5}$$

$=3+2$

KEEP base

#6-8

ADD exponents (little #s)

MULTIPLY coefficients (big #s)

Must have same base

Product of Powers #6-8

Simplify completely. Leave no negative exponents!

6. $5^{10} \bullet 5^{23} = 5^{10+23} = \boxed{5^{33}}$

7. $(-8)^2(-8)^5 = \boxed{(-8)^7}$

8. $5x^{-2} \bullet 6x^7 = \boxed{30x^5}$

Power of Powers

$$\left(4^2\right)^3 = (4^2)(4^2)(4^2) = \boxed{4^6} = 2 \cdot 3$$

$4 \cdot 4 \quad 4 \cdot 4 \quad 4 \cdot 4$

Multiply Exponents

Power of Product

$$\left(xy^2\right)^3 = (xy^2)(xy^2)(xy^2)$$

$x \cdot y \cdot y \quad x \cdot y \cdot y \quad x \cdot y \cdot y$

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

$$= \boxed{x^3 y^6}$$

#9-11

DISTRIBUTE to terms

MULTIPLY exponents

Power of Powers #9-11

Simplify completely. Leave no negative exponents!

9. $2(x^2)^{-3} = 2x^{-6} = \boxed{\frac{2}{x^6}}$

10. $(2x^2)^{-3} = \frac{1}{(2x^2)^3} = \frac{1}{2^3x^6} = \boxed{\frac{1}{8x^6}}$

$(2x^2)(2x^2)(2x^2)$

11. $(4ab^3c^2)^2 = (4ab^3c^2)(4ab^3c^2)$

$4abbbcc \quad 4abbbcc$

$4^2a^2(b^3)^2(c^2)^2 = \boxed{16a^2b^6c^4}$

Algebra I – Unit 7: Topic 1 – Multiplication Properties of Exponents $g = 0$

Practice – Multiplication Properties of Exponents **pp 460-466**

Name _____ Date _____ Period _____

Simplify the expressions below:

1. $n^6 g n^2$ $= n^6 \cdot n^2$
2. $x^2 g x^{-3} g x^4$ $x^2 \cdot x^{-3} \cdot x^4$
3. $(-3)^3 \bullet (-3)^2$
4. $a^5 g a^0 g a^{-5}$ $a^5 \cdot a^0 \cdot a^{-5}$

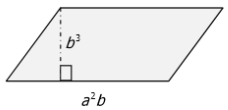
Simplify the expressions below:

5. $(x^2)^5$
6. $(3^{-2})^{-4}$
7. $(a^{-3})^4 g (a^7)^2$ $(a^{-3})^4 \cdot (a^7)^2$
8. $(p^4 q^2)^7$

Find the missing exponent in each expression:

9. $a^{\square} a^6 = a^{10}$
10. $(a^2 b^{\square})^4 = a^8 b^{12}$
11. $(a^3 b^6)^{\square} = \dfrac{1}{a^9 b^{18}}$

12. Write an expression for the area of the figure below: $A = bh$



13. Which expression best represents $(3a^2b^3c)(-3ab)(-2a^3bc^3)$?

F $18a^6b^5c^4$

G $-18a^6b^3c^3$

H $18a^6b^9c^4$

J $-8a^6b^5c^4$

14. Which expression describes the area in square units of a rectangle that has a length of $10x^3y^4$ units and a width of $5x^2y$ units?

F $2x^5y^4$
G $15x^5y^5$
H $50x^5y^4$
J $50x^5y^5$

HW Check!

1. n^8
2. x^3
3. $(-3)^5$
4. 1
5. x^{10}
6. 6561
7. a^2
8. $p^{28}q^{14}$

9. 4

10. 3

11. -3

12. a^2b^4

13. F

14. J

Quotient of Powers

$$\frac{2^6}{2^3}$$

Treat fraction bar (divides) like a giant minus.

SUBTRACT exponents

$$\frac{a^4}{a^{-2}}$$

Quotient of Powers #12-14

Simplify completely. Leave no negative exponents!

12. $\dfrac{x^9}{x^3}$

13. $\dfrac{a^5}{a^{10}}$

14. $\left(\dfrac{14a^0b^7c^{10}}{7a^3b^{-2}c}\right)$