

Exponents Day 3

Agenda

Warm-Up

HW Check

Notes

Match Game

HW #1-10

Reminders

Bathroom
passes due tmr!!Quiz/HW 4.6 due
Friday

Warm-Up Wednesday

1. Katie is buying soil for a rectangular $A=LW$ garden. If the length of the garden is $3x^2y^3$ units and the width of the garden is $9x^{-3}y^4$ units, what is the area of the garden?

$$A = (3x^2y^3)(9x^{-3}y^4) = 3 \cdot 9 \cdot x^2 \cdot x^{-3} \cdot y^3 \cdot y^4$$

$$= 27x^{-1}y^7 = \frac{27y^7}{x^1}$$

2. State the process used to answer the following question:

The width of a rectangular room is 20 feet. If the area is 200 ft^2 , what is the length of the room?

$$A = LW \Rightarrow \frac{200}{20} = \frac{20L}{20}$$

Questions, Comments, Concerns?

Algebra I – Unit 7: Topic 1 – Multiplication Properties of Exponents

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

Name _____ Date _____ Period _____

Simplify the expressions below:

1. $n^6 g n^2$

2. $x^2 g x^{-3} g x^4$

3. $(-3)^3 \cdot (-3)^2$

4. $a^5 g^0 g^{-5}$

Simplify the expressions below:

5. $(x^2)^5$

6. $(3^{-2})^{-4}$

$$7. (a^{-3})^4 (a^7)^2 = a^{-12} \cdot a^{14} = a^{-12+14} = a^2$$

$$8. (p^4 q^5)^7 = (p^4)^7 (q^5)^7 = p^{28} q^{35}$$

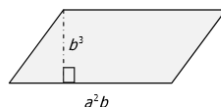
Find the missing exponent in each expression:

9. $a^{\square} a^6 = a^{10}$

10. $(a^2 b^{\square})^4 = a^8 b^{12}$

11. $(a^3 b^6)^{\square} = \frac{1}{a^9 b^{18}}$

12. Write an expression for the area of the figure below:

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

F $18a^6 b^5 c^4$
 G $-18a^6 b^5 c^4$
 H $18a^6 b^9 c^4$
 J $-8a^6 b^5 c^4$

Handwritten work: $3(-3)(-2) = 18$, $a^2 \cdot a \cdot a^2 = a^5$, $b^3 \cdot b \cdot b = b^5$, $c \cdot c^3 = c^4$. Final answer: $18a^5 b^5 c^4$.

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

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

Quotient of Powers

↑ Divide ÷

$$\frac{2^6}{2^3} = \frac{\cancel{2 \cdot 2 \cdot 2} \cdot \boxed{2 \cdot 2 \cdot 2}}{\cancel{2 \cdot 2 \cdot 2}} = 2^3 = 6-3$$

Top-bottom, same base

Treat fraction bar (divides) like a giant minus.

SUBTRACT exponents

$$\frac{a^4}{a^{-2}} = a^{4-(-2)} = \boxed{a^6}$$

$a^2 a^4$

#12-14

Quotient of Powers #12-14

Simplify completely. Leave no negative exponents!

$$12. \frac{x^9}{x^3} = \frac{\cancel{x} \cancel{x} \cancel{x} \cancel{x} \cancel{x} \cancel{x} \cancel{x} \cancel{x} \cancel{x}}{\cancel{x} \cancel{x} \cancel{x}} = x^{9-3} = \boxed{x^6}$$

$$13. \frac{a^5}{a^{10}} = a^{5-10} = a^{-5} = \frac{1}{a^5}$$

Diagram: 5 'a's over 10 'a's. 5 'a's are crossed out, leaving 5 'a's in the denominator. A '1' is written above the remaining 'a's.

$$14. \left(\frac{14 \cancel{a}^1 b^7 c^{10}}{7 \cancel{a}^3 b^{-2} c^1} \right) = \frac{2b^9 c^9}{a^3}$$

Diagram: The fraction is enclosed in a yellow box. The coefficient 14 is crossed out, leaving 7. The coefficient 7 is crossed out, leaving 2. The variable 'a' has a superscript of 1 in the numerator and 3 in the denominator, both crossed out. The variable 'b' has a superscript of 7 in the numerator and -2 in the denominator, both crossed out. The variable 'c' has a superscript of 10 in the numerator and 1 in the denominator, both crossed out. The result is 2b^9 c^9 over a^3.

Big #s (coefficients) DIVIDE

Handwritten calculations:
 $b^{7-(-2)} = b^9$
 $c^{10-1} = c^9$
 $\frac{14 \div 7}{7 \div 7} = \frac{2}{1}$

Exponent Card Match

Match the problem with the correct answer (on a shaded card). Show your work OR list the exponent property used.

~~Property bank:~~ Zero Power, Product Property, Quotient Property, Power to a Power



One side due by end of period

~~Example (pink cards)~~

| Problem | Process or Property | Answer |
|-----------|-------------------------------|----------|
| $x^6 x^7$ | x^{6+7} Product Property | x^{13} |

Quiz & completed HW 4.6 Due Friday

Algebra I – Unit 7: Topic 1 – Division Properties of Exponents

Practice – Division Properties of Exponents**pp 467-470**

Name _____ Date _____ Period _____

Simplify the expressions below:

1. $\frac{-3x^7}{6x^3}$

2. $\frac{15x^{-3}}{x}$

3. $\frac{8x^{10}y^7}{2x^6y^6}$

4. $\left(\frac{x^{-5}}{x^{-2}}\right)^5$

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

6. $\left(\frac{3b^2c}{6ab^3}\right)^{-2}$

7. A rectangular parking lot has an area of $10a^3b^6$ square yards. If the length of the park is $2a^3$, what is the width of the park?

8. Which expression best represents the simplification of $(3m^{-2}n^4)(-4m^6n^{-7})$?

F $-\frac{12m^4}{n^3}$

G $-\frac{1}{12m^4n^3}$

H $-\frac{m^4n^3}{12}$

J $-\frac{12n^3}{m^4}$

9. Which expression is equivalent to $(-5abc^4)(-3a^3c^2)(-4a^2b^4c^3)$?
- A. $-12a^6b^5c^9$
 B. $-12a^5b^4c^{24}$
 C. $-60a^6b^5c^9$
 D. $-60a^3b^3c^9$

10. The volume of a rectangular prism is $125x^3$ cubic units, and the area of its base is $25x^2y^2$ square units. What is the height of the prism in units if $x > 0$ and $y > 0$?

Quiz Bonus!! +15 points on Friday's quiz

Check twitter

(<http://twitter.com/mskmath>)

for a quiz bonus!

Tweet your answers to [@mskmath](#) or
email them to sara.korotkow@risd.org

BEFORE 9AM Friday!

H.W. Help: Division Properties of Exponents

Simplify completely. Leave no negative exponents!

NO WORK = NO CREDIT = NO KIDDING!

1. $-\frac{1}{2}x^4$

2. $\frac{15}{x^4}$

3. $4x^4y$

4. $\frac{1}{x^{15}}$

5. $\frac{x^5}{y^{17}}$

6. $\frac{4a^2b^2}{c^2}$

7. $5b^6$ yards

8. F

9. C

10. $\frac{5x}{y^2}$ units

Remember: If there is a fraction bar, DIVIDE coefficients and SUBTRACT exponents on like bases.

Quiz Bonus!!

+15 points on tomorrow's quiz

Simplify completely. Leave no negative exponents!

Tweet your answers to [@mskmath](#) or email them to sara.korotkow@risd.org BEFORE 9AM Friday!

1. $\left(\frac{345x^{23}y^{78}z^{945}}{2560x^{10}y^{156}z^{90}} \right)^0$

2. $(5x^7yz^4)(-4x^3y^2z)$

3. $\frac{b^6c^5}{b^{14}c^2}$

