Warm Up April 22, 2019

1.) A length of a side of a square is *x-4*. Find the area and perimeter of the square.

$A = x^2 - 8x + 16 \qquad P = 4x - 16$

2.) A rectangle has a length of *x* inches and a width 4 inches less than the length. If the dimensions are doubled, what would the area of the rectangle be?

$A = 4x^2 - 16x$

3.) Simplify: $(-8m^4n^7)^2 - (2m^2n)^3 \bullet (5m^2n^{11})$

$64m^8n^{14} - 8m^6n^3 \cdot 5m^2n^{11}$

$64m^8n^{14} - 40m^8n^{14}$

$24m^8n^{14}$

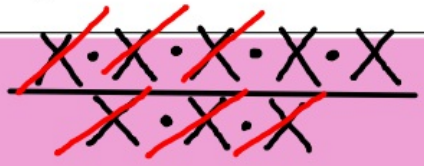
DIVIDING MONOMIALS

- **Step 1:** Divide the coefficients.
- **Step 2:** Use the **QUOTIENT RULE** to simplify the exponents.

QUOTIENT RULE:

$$\frac{x^a}{x^b} = x^{a-b}$$

1. $\frac{x^5}{x^3} = x^2$



Subtract the exponents
Top - bottom

2. $\frac{k^8}{k^3} = k^{8-3} = k^5$

$$\frac{m^3}{m^3} = m^0 = 1$$

5. $\frac{6x^4}{2x^3} = 3x$	6. $\frac{14x^2y^2}{7xy} = 2xy$

9. $\frac{4n^5}{8n} = \frac{1}{2}n^4$ OR $\frac{n^4}{2}$	10. $\frac{36x^9y^5}{54x^3y^2} = \frac{2}{3}x^6y^3$

Putting it all together

SIMPLIFY THE MONOMIALS COMPLETELY. (Make sure to only do one step at a time!)

11. $\frac{(3x^5)^2}{27x^3}$

$\frac{9x^{10}}{27x^3}$

$(3)^2(x^5)^2$

$\frac{1}{3}x^7$

12. $\frac{(2a^2b^4)^3}{4a^3b^7}$

$(2)^3(a^2)^3(b^4)^3$

$\frac{8a^6b^{12}}{4a^3b^7}$

$2a^3b^5$

15. $\left(\frac{12x^5}{15x}\right)^2$

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

$\frac{16}{25}x^8$

16. $\left(\frac{4ab^2}{5ab}\right)^2$

$\left(\frac{4}{5}b\right)^2$

$\frac{16}{25}b^2$

19. $\frac{(8cd^3)(-3c^4)}{6c^2d} - 9c^3d^2$

$\frac{-24c^5d^3}{6c^2d^1} - 9c^3d^2$

$-4c^3d^2 - 9c^3d^2$

$-13c^3d^2$

20. $\frac{(-6x^4y^6)^2}{(-3x^3y^5)^2} - 7x^2y^2$

$\frac{36x^8y^{12}}{9x^6y^{10}} - 7x^2y^2$

$4x^2y^2 - 7x^2y^2$

$-3x^2y^2$

What happens when you divide and your exponent is negative?!?

$$\frac{b^2c}{b^2c^5}$$

Do you....

A. Pretend the negative is not there?

B. Subtract the top from the bottom instead?

C. Freak out because you did something wrong?

D. Use the negative exponent rule.

NEGATIVE EXPONENTS

NEGATIVE EXPONENT RULE:

$$x^{-a} = \frac{1}{x^a}$$

1. x^{-5} $\frac{1}{x^5}$	**2.** $3m^{-2}$ $\frac{3}{m^2}$	**3.** $-7a^{-4}b^3$ $\frac{-7b^3}{a^4}$

7. $(-8x^5y^{-4})^{-2}$

$(-8)^{-2}(x^5)^{-2}(y^{-4})^{-2}$

OR

$\frac{1}{(-8x^5y^{-4})^2}$

$\frac{1}{64x^{10}y^{-8}}$

$\frac{y^8}{64x^{10}}$

8. $(a^{-5}b^8c^{-12})(a^7b^{-3}c^7)$

$a^2b^5c^{-5}$

$\frac{a^2b^5}{c^5}$

9. $(x^2y^3)^{-2} \cdot (x^5y^4)^{-3}$

$x^{-4}y^{-6} \cdot x^{-15}y^{-12}$

$x^{-19}y^{-18}$

$\frac{1}{x^{19}y^{18}}$

13. $\frac{14w^4}{7w^{-2}}$

$2w^{4-(-2)}$

$2w^6$

14. $\frac{-24x^5}{3x^{-2}}$

$-8x^7$

15. $\frac{b^2c}{b^2c^5}$

$b^{2-2}c^{1-5}$

b^0c^{-4}

1

$\frac{1}{c^4}$

19. $\frac{15ab^5c^8}{18ab^3c^9}$	**20.** $\frac{-4pq^5r^3}{8p^2q^2r^{10}}$	**21.** $\frac{-9r^2s^6t^4}{54r^5s^2t^8}$

CHALLENGE!

22. $\dfrac{(6a^3)(5a^9)}{-12a^{14}}$

23. $\dfrac{(3xy)^2(2x^4y^3)}{6x^8y}$

24. $\dfrac{(-6x^4y^6)^2}{(-4x^{-3}y^5)^3}$

25. $\dfrac{(6bc^3)(3b^5c^2)}{(5b^5c^2)(2b^3c^6)}$