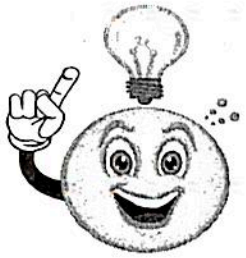
Algebra RH

Essential Question: What are the division properties of exponents?

Do Now: Evaluate. You may use a calculator.

a. $\frac{3^9}{3^5}$ b. 3^4 c. $\left(\frac{4}{5}\right)^3$ d. $\frac{4^3}{5^3}$

Rules We Know…



- ***Zero power and Negative Exponents***: $a^0 = 1, a \neq 0$

  $a^{-n} = \frac{1}{a^n}$ and $\frac{1}{a^{-n}} = a^n, a \neq 0$

- ***Product of Powers Property***: $a^m \bullet a^n = a^{m+n}$
- ***Power of a Power Property***: $(a^m)^n = a^{m \bullet n}$
- ***Power of a Product Property***: $(a \bullet b)^m = a^m \bullet b^m$

Division Properties of Exponents

Quotient of Powers Property	**When dividing powers with the same base, _____ the exponents.**	
Power of a Quotient Property	**When raising a fraction to a power, raise the _____ and _____ to the power.**	

Examples:

1. $\frac{(-6)^5}{(-6)^3}$ 2. $\frac{9^4 \bullet 9^2}{9^7}$ 3. $\frac{y^{-3}}{y^5}$

4. $\left(\frac{2}{3}\right)^2$

5. $\left(-\frac{3}{y}\right)^3$

6. $\left(\frac{5}{4}\right)^{-3}$

More Complicated Expressions

7. $\frac{x^2y^3}{xy^4}$

8. $\left(\frac{2x^2y^4}{xy}\right)^3$

9. $\frac{2x^2y}{3x} \bullet \frac{9xy^2}{y^4}$

10. $\left(\frac{3x^2y}{x^8y^{-5}}\right)^3$

11. $\frac{-6x^3y^4}{4y} \bullet \frac{16x^2}{6xy}$

12. $\frac{20x^3y}{4xy^3} \bullet \frac{-6xy}{-x}$

Challenge: $\left(\frac{2xy^{-2}y^4}{3x^{-1}y}\right)^{-2} \bullet \left(2x^2y^4\right)^2$