Exponent Laws Part 1 NOTES

Investigation 1: Multiplication	Exponent Law 1: Product of a Power
Write the expression below as a single power: $6^5 \times 6^4$	When multiplying powers with the same base, <u>Add</u> the exponents to simplify. $(A^m)(A^n) = A^{m+n}$

Investigation 1:

First Expand:

$(6 \times 6 \times 6 \times 6 \times 6) \times (6 \times 6 \times 6 \times 6)$

Then simplify as a single power: Nine 6 multiplied together.

6^9

$5^4 \times 5^6 = 5^{10}$	$2^3 \times 2^5 = 2^8$
$(-7)^2 \times (-7)^2 = (-7)^4$	$10^6 \times 10^3 \times 10^2 = 10^{11}$

Investigation 2: Division

Write the expression below as a single power:
$$\frac{9^{10}}{9^6}$$

First Expand:

$$\frac{9 \times 9 \times 9 \times 9 \times 9 \times 9 \times 9 \times 9 \times 9 \times 9}{9 \times 9 \times 9 \times 9 \times 9}$$

$\frac{9}{9} = 1$ So you can cancel out

Then simplify as a single power:

9^4

Exponent Law 2: Quotient of a Power

When dividing powers with the same base, <u>Subtract</u> the exponents to simplify.
$(A^m) \div (A^n) = A^{m-n}$

$5^6 \div 5^4 = 5^2$	$\frac{10^{11}}{10^3} = 10^8$
$(-7)^2 \div (-7)^2 = (-7)^0$	$3^3 \times 3^7 \div 3^4 = 3^{10} \div 3^4 = 3^6$

Simplify, then evaluate:

$3^2 \times 3^5 - 4^7 \div 4^6$

$3^7 - 4^1$

$2187 - 4$

$\boxed{2183}$

Simplify, then evaluate:

$$\frac{2^3 \times 2^5}{2^6} = \frac{2^8}{2^6} = 2^2 = \boxed{4}$$