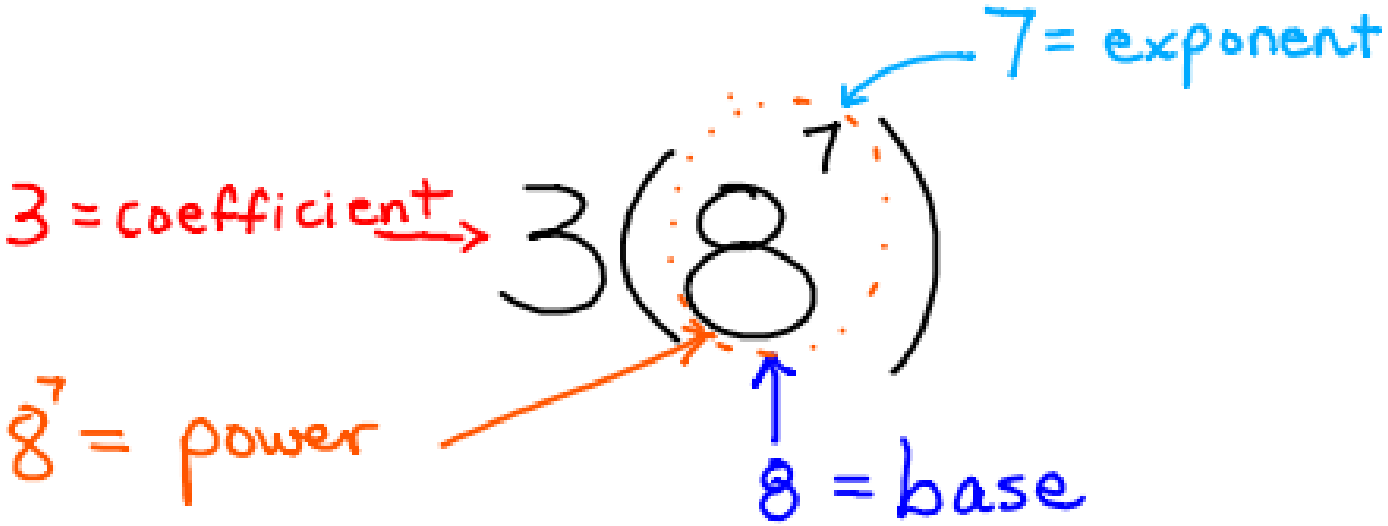
Math 9
Semester End Review

Exponents and Powers

Terminology



Expanding Powers

$8^4 = 8 \times 8 \times 8 \times 8$

$(-5)^3 = (-5)(-5)(-5)$

$-7^2 = -1 \times 7 \times 7$

Writing Powers

$(5)(5)(5)(5)(5)(5) = 5^{6}$

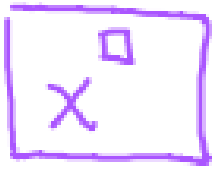
$(-2)(-2)(-2)(-2) = (-2)^{4}$

$-1 \times 3 \times 3 \times 3 = -3^{3}$

$5 \times (-3)(-3)(-3)(-3)(-3) = 5(-3)^{5}$

$$\left(\frac{2}{3}\right)\left(\frac{2}{3}\right)\left(\frac{2}{3}\right) = \left(\frac{2}{3}\right)^3 \qquad \frac{2}{3}^3$$

Evaluating Powers

Power button   

$4^7 = 16384$

$(-4)^7 = -16384$

$(-4)^4 = 256$

$-4^4 = -256$

$-2(1)^{715} = -2$

"1" to any power = 1

$(-1)^{715} = -1$

$(-1)^{716} = 1$

$$\left(\frac{1}{3}\right)^6 = \frac{1^6}{3^6} = \frac{1}{729}$$

$$(0.3)^6 = 7.29\ E^{-4} = 7.29 \times 10^{-4}$$

$$= 0.000729$$

Exponent Laws

Products: $2^4 \times 2^6 = 2^{4+6} = 2^{10}$

Quotients: $\frac{3^{11}}{3^3} = 3^{11-3} = 3^8$

Power of powers: $(5^2)^4 = 5^{2\times 4} = 5^8$

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

$$(2 \times 5)^4 = 2^4 \times 5^4$$

$$8^0 = 1$$

Evaluating (Bedmas)

$$\frac{4^3 \times 4^{11}}{4^4} = \frac{4^{14}}{4^4} = 4^{10} = 1\,048\,576$$

$$2(7^2) + (8^3)(-1)^4$$

$$= 2(49) + (512)(1)$$

$$= 98 + 512 = 610$$