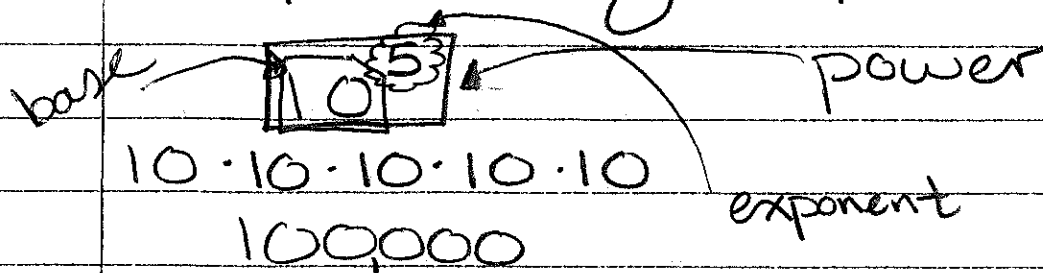


Oct. 17<sup>th</sup>

# Properties of Exponents



$$a \cdot a \cdot a \cdot a \quad \text{expanded form}$$
$$a^4 \quad \text{form}$$

$$2^3 \cdot 2^5 \quad a^3 \cdot a^5$$
$$8 \cdot 32 \quad a \cdot a \cdot a \cdot a \cdot a \cdot a \cdot a$$
$$256 \quad a^{3+5}$$
$$a^8$$

$$\frac{32}{256}$$

\* Any time you have the same base being multiplied you can add the exponents together to simplify \*

$$3^4 \cdot 3^{10}$$
$$3^{4+10}$$
$$3^{14}$$

$$m^2 \cdot m^6$$
$$m^{2+6}$$
$$m^8$$

$$(3^2)^3$$

$$3^2 \cdot 3^2 \cdot 3^2$$

$$3^{2+2+2}$$

$$3^6$$

$$(5^3)^6$$

$$5^{3 \cdot 6}$$

$$5^{18}$$

$$(x^{10})^5$$

$$x^{10 \cdot 5}$$

$$x^{50}$$

\* when you have a power raised to another exponent you multiply the 2 exponents to clear the parentheses \*

$$3^7 \div 3^3$$

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

$$\begin{array}{r} | 21 \\ 3^4 \\ 3^{10} \end{array}$$

$$\frac{3 \cdot 3 \cdot \cancel{3} \cdot \cancel{3} \cdot \cancel{3} \cdot 3 \cdot 3}{\cancel{3} \cdot \cancel{3} \cdot \cancel{3}}$$

$$3^4$$

$$3^{7-3}$$

$$3^4$$

\* when same bases are being divided we subtract the exponents &

$$\frac{2^7}{2^2}$$

$$2^{7-2}$$

$$2^5$$

$$11^{16} \div 11^9$$

$$\frac{11^{16}}{11^9}$$

$$11^9$$

$$11^{16-9}$$

$$11^7$$

$$\frac{C^{15}}{C^7}$$

$$C^7$$

$$C^{15-7}$$

$$C^8$$

$$3^2 \cdot 7^2$$

$$9 \cdot 49$$

$$441$$

$$(3 \cdot 7)^2$$

$$21^2$$

$$441$$

$$\begin{array}{r} 21 \\ 21 \\ \hline 420 \\ \hline 441 \end{array}$$

$$2^3 \cdot 5^3$$

$$8 \cdot 125$$

$$1000$$

$$(2 \cdot 5)^3$$

$$10^3$$

$$1000$$

\* when the bases are different but the exponents are the same you can multiply the bases together & then raise to the original exponent

$$\textcircled{1} a^4 \cdot a^{16}$$

$$a^{4+16}$$

$$a^{20}$$

$$\textcircled{2} \frac{3^{16}}{3^5}$$

$$3^{16-5}$$

$$3^{11}$$

$$\textcircled{3} (x^3)^7$$

$$x^{3 \cdot 7}$$

$$x^{21}$$

$$\textcircled{4} 2^4 \cdot 3^4$$

$$(2 \cdot 3)^4$$

$$6^4$$

$$1296$$

$$\begin{array}{r} 36 \\ 36 \\ \hline 216 \\ 1080 \\ \hline 1296 \end{array}$$

$$\textcircled{5} 2^7 \cdot 2^{-2}$$

$$2^5$$

$$\textcircled{6} 5^7 \div 5^1$$

$$5^{7-1}$$

$$5^6$$

$$\textcircled{7} (5^8)^6$$

$$5^{48}$$

$$\textcircled{8} \frac{4^4}{2^2}$$

$$2^2$$