

Feb. 29th, 2016

# Unit 3 Day 2

## 3-2 Exponent Laws: Products + Quotients

$$\begin{aligned} 1) \quad & 2^3 \cdot 2^2 \\ & = (2 \cdot 2 \cdot 2)(2 \cdot 2) \\ & = 2^{3+2} \\ & = 2^5 \end{aligned}$$

$$\begin{aligned} 2) \quad & 5 \cdot 5^3 \\ & = 5(5 \cdot 5 \cdot 5) \\ & = 5^{1+3} \\ & = 5^4 \end{aligned}$$

$$\begin{aligned} 3) \quad & 3^5 \cdot 3^6 \\ & = 3^{5+6} \\ & = 3^{11} \end{aligned}$$

$x^a \cdot x^b = x^{a+b}$  Exponent Product Law

$$\begin{aligned} 4) \quad & 8^9 \cdot 8^3 \\ & = 8^{12} \end{aligned}$$

$$\begin{aligned} 5) \quad & a^7 \cdot a^8 \cdot a \\ & = a^{16} \end{aligned}$$

$$\begin{aligned} 6) \quad & 5^3 x^2 \\ & = 5^3 x^2 \quad * \end{aligned}$$

### Quotients

$$\begin{aligned} 7) \quad & \frac{3^5}{3^2} \\ & = \frac{3 \cdot 3 \cdot 3 \cdot \cancel{3} \cdot \cancel{3}}{\cancel{3} \cdot \cancel{3}} \\ & = 3^{5-2} \\ & = 3^3 \end{aligned}$$

$$\begin{aligned} 8) \quad & \frac{x^6}{x} \\ & = \frac{x \cdot x \cdot x \cdot x \cdot x \cdot x}{x} \\ & = x^{6-1} \\ & = x^5 \end{aligned}$$

$$\begin{aligned} 9) \quad & x^{12} \div x^8 \\ & = x^{12-8} \\ & = x^4 \end{aligned}$$

$\frac{x^a}{x^b} = x^{a-b}$  Exponent Law for Quotients

$$\begin{aligned} 10) \quad & \frac{2^3 \cdot 2^5}{2^2 \cdot 2} \\ & = \frac{2^8}{2^3} \\ & = 2^5 \end{aligned}$$

$$\begin{aligned} 11) \quad & \frac{3^5 \cdot 3^7 \cdot 3^2}{3^4 \cdot 3^3} \\ & = \frac{3^{14}}{3^7} \\ & = 3^7 \end{aligned}$$

$$12) \frac{64 \cdot 128 \cdot 1024}{512}$$

$$= \frac{2^6 \cdot 2^7 \cdot 2^{10}}{2^9}$$

$$= \frac{2^{23}}{2^9}$$

$$= 2^{14}$$

$$13) \frac{59049 \cdot 2187 \cdot 81}{6561}$$

$$= \frac{3^{10} \cdot 3^7 \cdot 3^4}{3^8}$$

$$= \frac{3^{21}}{3^8}$$

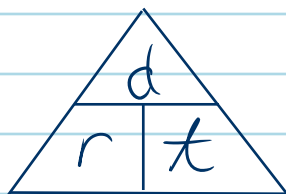
$$= 3^{13}$$

### Problem Solving

d = distance

r = rate

t = time



Mnemonic

-memory aid

$$d = rt$$

$$r = \frac{d}{t}$$

$$t = \frac{d}{r}$$

14) At a rate of  $10^5$  km/h, how long would it take to travel  $10^{14}$  km?

$$\rightarrow t = \frac{d}{r}$$

$$t = \frac{10^{14} \text{ km}}{10^5 \text{ km/h}}$$

$$t = 10^9 \text{ h}$$

Practice 3-2