W-PA Pre-Algebra Week 17 1/25

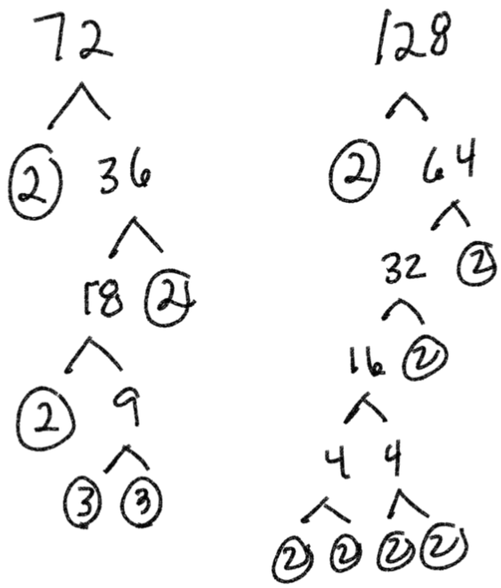
72, 128

1.) Prime Factorize

2.) GCF

3.) LCM

4.) Reduce $\frac{72}{128}$



$72: 3 \cdot 3 \cdot 2 \cdot 2 \cdot 2 = 3^2 \cdot 2^3$

$128: 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = 2^7$

GCF $3 \cdot 3 \cdot 2 \cdot 2 \cdot 2$

$2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$

$2 \cdot 2 \cdot 2 = \boxed{8}$

LCM

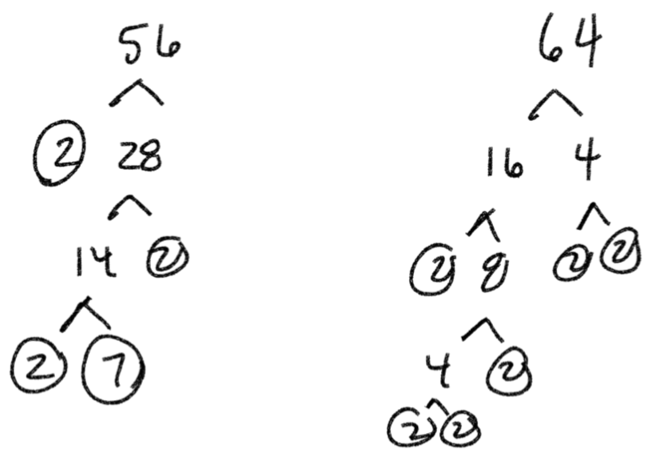
$3 \cdot 3 \cdot \cancel{2} \cdot \cancel{2} \cdot \cancel{2} = 9$

$2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = 128$

$128 \cdot 9 = \boxed{1152}$

Reduce $\frac{72}{128}$ $\frac{3 \cdot 3 \cdot \cancel{2} \cdot \cancel{2} \cdot \cancel{2}}{\cancel{2} \cdot \cancel{2} \cdot \cancel{2} \cdot 2 \cdot 2 \cdot 2 \cdot 2} = \boxed{\frac{9}{16}}$

$56, 64$



1.) Prime Factorize

2.) GCF

3.) LCM

4.) Reduce $\frac{56}{64}$

$56: 7 \cdot 2 \cdot 2 \cdot 2 = 7 \cdot 2^3$

$64: 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = 2^6$

GCF

Save

$56: 7 \cdot 2 \cdot 2 \cdot 2$

$64: 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$

$2 \cdot 2 \cdot 2 = \boxed{8}$

LCM

Thanos

$56: 7 \cdot \cancel{2} \cdot \cancel{2} \cdot \cancel{2}$

$64: 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$

$= \begin{matrix} 7 \\ 64 \end{matrix}$

$64 \cdot 7 = \boxed{448}$

Reduce

$$\frac{56: 7 \cdot 2 \cdot 2 \cdot 2}{64: 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2} = \boxed{\frac{7}{8}}$$

$20x^3y^4$, $24x^2y^6$

$$20 \to 5,\ 4;\quad 4 \to 2,\ 2$$

$$24 \to 6,\ 4;\quad 6 \to 3,\ 2;\quad 4 \to 2,\ 2$$

1.) Prime Factorize

2.) GCF

~~3.) LCM~~

4.) Reduce $\dfrac{20x^3y^4}{24x^2y^6}$

$20: 5 \cdot 2 \cdot 2$

$24: 3 \cdot 2 \cdot 2 \cdot 2$

$20x^3y^4: 5 \cdot 2 \cdot 2 \cdot x \cdot x \cdot x \cdot y \cdot y \cdot y \cdot y$

$24x^2y^6: 3 \cdot 2 \cdot 2 \cdot 2 \cdot x \cdot x \cdot y \cdot y \cdot y \cdot y \cdot y \cdot y$

GCF $2 \cdot 2 \cdot x \cdot x \cdot y \cdot y \cdot y \cdot y$

$\boxed{4x^2y^4}$

$20x^3y^4 \quad 24x^2y^6$

choose the smallest exponent

Reduce

$$\frac{20x^3y^4}{24x^2y^6} : \frac{5 \cdot 2 \cdot 2 \cdot x \cdot x \cdot x \cdot y \cdot y \cdot y \cdot y}{3 \cdot 2 \cdot 2 \cdot 2 \cdot x \cdot x \cdot y \cdot y \cdot y \cdot y \cdot y \cdot y} = \frac{5x}{6y^2}$$

Subtract exponents

$\underline{x\text{'s}}$ $\quad \dfrac{x^3}{x^2} \leftarrow$ Big $\quad x^{3-2} = \boxed{x^1}$

y's $\quad \dfrac{y^4}{y^6} \quad y^{4-6}$

$y^{-2} = \dfrac{1}{y^2}$

$$\frac{36a^5b^3c^{10}}{54a^7bc^5}$$

Reduce.

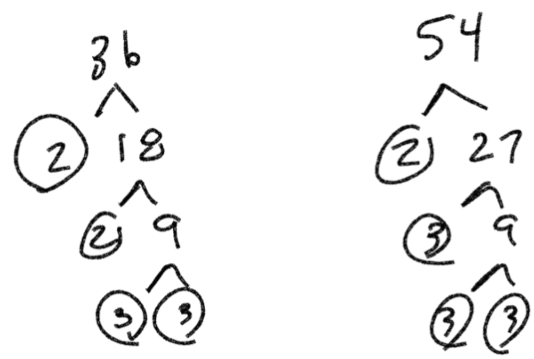
$$\frac{2b^2c^5}{3a^2}$$

$$\frac{36: \cancel{3}\cdot\cancel{3}\cdot\cancel{2}\cdot 2}{54: \cancel{3}\cdot\cancel{3}\cdot 3\cdot\cancel{2}}$$

$$\frac{a^5}{a^7} = a^{5-7} = a^{-2} = \frac{1}{a^2}$$

$$\frac{b^3}{b} = \frac{b^3}{b^1} = b^{3-1} = b^2 \qquad \frac{b^3}{b} = \frac{\cancel{b}\cdot b\cdot b}{\cancel{b}} = b^2$$

$$\frac{c^{10}}{c^5} = c^{10-5} = c^5$$



$$4^5 = \boxed{4\cdot4\cdot4\cdot4\cdot4}$$

$$3\cdot3\cdot3\cdot3\cdot3\cdot3\cdot3 = \boxed{3^7}$$

$$a\cdot a\cdot a\cdot a\cdot a\cdot a\cdot a\cdot a = \boxed{a^8}$$

exponents before multiplication

PEMDAS

$3x^5 \qquad x=2 \qquad 3(2)^5 = 3(32) \; \boxed{96}$

$$3\cdot\underbrace{2\cdot2\cdot2\cdot2\cdot2}_{32}$$

$a^4 b^2 c * a^2 b^2 c^4 = a^6 b^4 c^5$

$\boxed{a \cdot a \cdot a \cdot a} \cdot \boxed{b \cdot b} \cdot \boxed{c} * \boxed{a \cdot a} \cdot \boxed{b \cdot b} \cdot \boxed{c \cdot c \cdot c \cdot c}$

$a^6 b^4 c^5$

When you multiply expments of the same base, you add them.

$a^{\boxed{4}} b^{\boxed{2}} c^{\boxed{1}} * a^{\boxed{2}} b^{\boxed{2}} c^{\boxed{4}}$

$a^{4+2} = a^6 \qquad b^{2+2} = b^4 \qquad c^{1+4} = c^5$

$x^7 y^8 z^2 * x^3 y^5 z^7 = \boxed{x^{10} y^{13} z^9}$

$x^{7+3} = x^{10}$

$y^{8+5} = y^{13}$

$z^{2+7} = z^9$

$$\frac{x^9 y^6 z^4}{x^7 y z^8} = \frac{x^2 y^5}{z^4}$$

$x^{9-7} = x^2$

Dividing is simply subtracting

$y^{6-1} = y^5$

$z^{4-8} = z^{-4}$

$$\frac{a^4}{a^4} = a^{4-4} = a^0 = 1 \qquad \frac{a^4 = \cancel{a}\cdot\cancel{a}\cdot\cancel{a}\cdot\cancel{a}}{a^4 = \cancel{a}\cdot\cancel{a}\cdot\cancel{a}\cdot\cancel{a}} = \frac{1}{1} = 1$$

$3^0 = 1$ $\qquad 1{,}027^0 = 1$ $\qquad$ ()$^0 = 1$ $\qquad 0^0 \neq 1$

$$(a^2)^3 = a^2 \cdot a^2 \cdot a^2 = a^{2+2+2} = a^6$$

1.) $4a^2b^5 * 2a^3b^8 = \boxed{8a^5b^{13}}$

2.) $\dfrac{18x^4y^7z^9}{3xy^4z^{12}} = 6x^3y^3z^{-3} = \boxed{\dfrac{6x^3y^3}{z^3}}$

3.) $(3^1a^4b^7)^2 = 3^2a^8b^{14} = \boxed{9a^8b^{14}}$