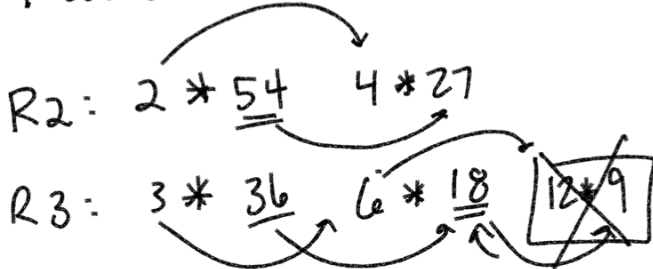


108

$1 + 0 + 8 = 9$

Factors



R5:

R9:  $9 * 12$

R10:

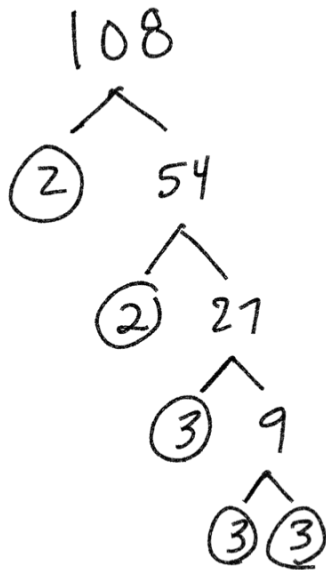
- 1 \* 108    4 \* 27
- 2 \* 54    6 \* 18
- 3 \* 36    9 \* 12

$$\begin{array}{r} 3 \\ 3 \overline{) 108} \\ \underline{-9} \phantom{0} \\ 18 \\ \underline{-18} \\ 0 \end{array}$$

Even R2  
0, 2, 4, 6, 8

- 1, 2, 3, 4, 6, 9, 12, 18, 27, 36, 54, 108

Prime Factorization

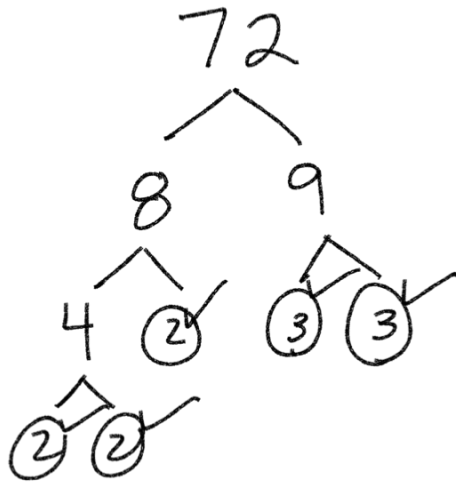


Prime numbers: Numbers divisible only by itself and me.

- 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, ...

$108 = \underbrace{3 \cdot 3 \cdot 3}_{3^3} \cdot \underbrace{2 \cdot 2}_{2^2}$

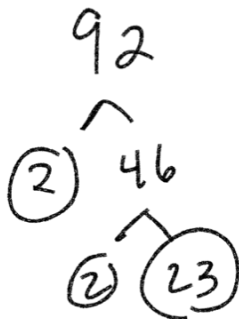
Find Prime Factorization



$$72 = 3 \cdot 3 \cdot 2 \cdot 2 \cdot 2$$

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

Greatest Common Factor

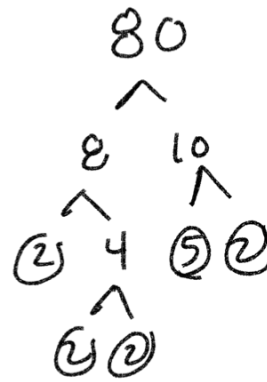


$$92 = 23 \cdot 2 \cdot 2 = 23 \cdot 2^2$$

$$80 = 5 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = 5 \cdot 2^4$$

$$\frac{80}{92} = \text{Reduce}$$

$$\frac{80}{92} = \frac{5 \cdot \cancel{2} \cdot \cancel{2} \cdot 2 \cdot 2}{23 \cdot \cancel{2} \cdot \cancel{2}} = \frac{20}{23}$$



$$\text{GCF} = 2 \cdot 2 = 4$$

LCM Least Common Multiple

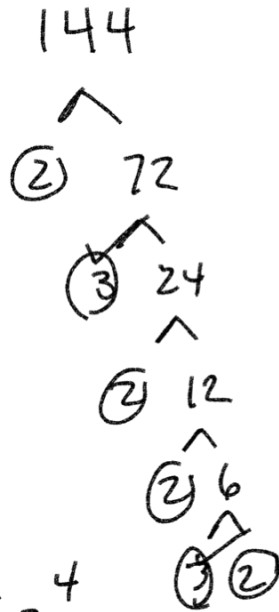
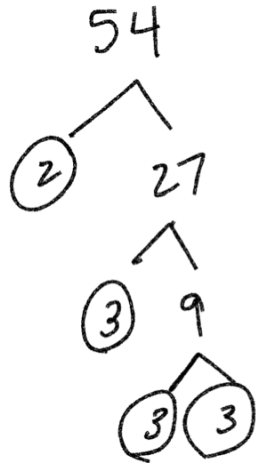
$$80 = 5 \cdot \cancel{2} \cdot \cancel{2} \cdot 2 \cdot 2 \rightarrow 80$$

$$92 = 23 \cdot \cancel{2} \cdot \cancel{2} \rightarrow 23$$

$$80 \times 23 = 1840$$

# 1.) Prime Factorize

$$\begin{array}{r} 27 \\ 2 \overline{) 54} \\ \underline{-4} \phantom{4} \\ 14 \\ \underline{-14} \\ 0 \end{array}$$



27

$$2 + 7 = 9$$

$$3 \overline{) 9}$$

$$54: 3 \cdot 3 \cdot 3 \cdot 2 = 3^3 \cdot 2$$

$$144: 3 \cdot 3 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = 3^2 \cdot 2^4$$

$$3 \overline{) 27}$$

Save GCF

$$54: 3 \cdot 3 \cdot 3 \cdot 2$$

$$144: 3 \cdot 3 \cdot 2 \cdot 2 \cdot 2 \cdot 2$$

GCF:  $3 \cdot 3 \cdot 2$

(18)

Thom's LCM

(432)

$$54 = \cancel{3} \cdot \cancel{3} \cdot 3 \cdot 2 \rightarrow 3$$

$$144 = \cancel{3} \cdot \cancel{3} \cdot \cancel{2} \cdot \cancel{2} \cdot 2 \cdot 2 \rightarrow 144$$

$$\begin{array}{r} 144 \\ \times 3 \\ \hline 432 \end{array}$$

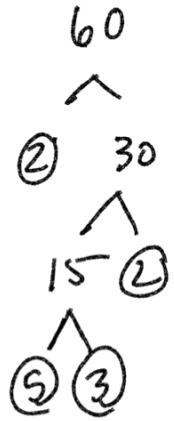
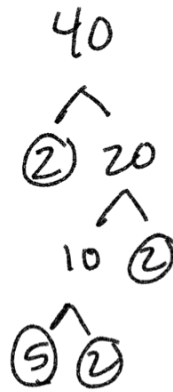
Kill Reduce

$$\frac{54}{144} = \frac{\cancel{3} \cdot \cancel{3} \cdot 3 \cdot 2}{\cancel{3} \cdot \cancel{3} \cdot \cancel{2} \cdot \cancel{2} \cdot 2 \cdot 2} = \boxed{\frac{3}{8}}$$

40, 60

1.) Reduce

$$\frac{40}{60} = \frac{\cancel{5} \cdot \cancel{2} \cdot \cancel{2} \cdot \cancel{2}}{\cancel{5} \cdot 3 \cdot \cancel{2} \cdot \cancel{2}} = \boxed{\frac{2}{3}}$$



2.) GCF

$$\frac{\cancel{5} \cdot \cancel{2} \cdot \cancel{2} \cdot \cancel{2}}{\cancel{5} \cdot 3 \cdot \cancel{2} \cdot \cancel{2}} \\ 5 \cdot 2 \cdot 2 = \boxed{20}$$

40:  $\cancel{5} \cdot \cancel{2} \cdot \cancel{2} \cdot \cancel{2}$   
 $5 \cdot 2^3$

60:  $5 \cdot 3 \cdot 2 \cdot 2$   
 $5 \cdot 3 \cdot 2^2$

3.) LCM

$$\frac{\cancel{5} \cdot \cancel{2} \cdot \cancel{2} \cdot \cancel{2}}{\cancel{5} \cdot 3 \cdot \cancel{2} \cdot \cancel{2}} \rightarrow 60 \\ 2 \cdot 60 = \boxed{120}$$

"expanded"

Reduce

kill

$$\frac{12x^3y^4}{16x^2y^8} = \frac{12 \cdot x \cdot x \cdot x \cdot y \cdot y \cdot y \cdot y}{16 \cdot x \cdot x \cdot y \cdot y \cdot y \cdot y \cdot y \cdot y}$$

12      16       $12x^3y^4 = \cancel{3 \cdot 2 \cdot 2 \cdot x \cdot x \cdot x \cdot y \cdot y \cdot y \cdot y}$

$\textcircled{2} \ 6$        $\textcircled{2} \ 4 \ 4$        $16x^2y^8 = \cancel{2 \cdot 2 \cdot 2 \cdot 2 \cdot x \cdot x \cdot y \cdot y \cdot y \cdot y \cdot y \cdot y}$

$\textcircled{2} \ \textcircled{3}$        $\textcircled{2} \ \textcircled{2} \ \textcircled{2} \ \textcircled{2}$

$\downarrow$

$$\frac{3x}{4y^4}$$

$$\boxed{\frac{3x}{4y^4}}$$

$$\frac{8x^5y^6}{12x^2y^{11}} = \frac{\cancel{2} \cdot \cancel{2} \cdot \cancel{2} x^3}{3 \cdot \cancel{2} \cdot \cancel{2} y^5} = \frac{2x^3}{3y^5}$$

$$x^{5-2} = x^3$$

$$y^{11-6} = y^5$$

Reduce

GCF

$$2 \cdot \cancel{2} \cdot \cancel{2} = 4$$

take the smaller exponent  $\boxed{4x^2y^6}$

$$\frac{8x^5y^6}{12x^2y^{11}}$$