

# GCF

## When Comparing 2 or More Numbers....

### GCF - Greatest Common Factor

Is the largest COMMON number that will divide into each

- you can list the factors or use prime factorization trees

Prime Factorization

$$\begin{array}{r} \underline{6} \\ 1 \times 6 \\ 2 \times 3 \\ 1, 2, 3, \underline{6} \end{array}$$

Ex) GCF (6, 12) = 6

$$\begin{array}{r} \underline{12} \\ 1 \times 12 \\ 2 \times 6 \\ 3 \times 4 \\ 1, 2, 3, 4, \underline{6}, 12 \end{array}$$

$$\begin{array}{r} \underline{12} \\ 2 \quad 6 \\ \quad 2 \quad 3 \\ 2 \quad 3 \end{array}$$

$$12 = 2 \times 2 \times 3 \\ = 2^2 \times 3$$

$$\begin{array}{r} \underline{6} \\ 2 \quad 3 \\ 2 \times 3 \end{array}$$

$$6 \Rightarrow 2 \times 3$$

Underline the common primes (then multiply them and that give you the GCF)

$$\begin{array}{l} \text{Common prime} \Rightarrow 2, 3 \\ 2 \times 3 \\ = \underline{6} \end{array}$$

# LCM

## When Comparing 2 or More Numbers....

### LCM - Lowest Common Multiple

Is the largest COMMON multiple

- you can list the multiples of each number and circle the common multiple that fall in all list Prime Factorization

or

use prime factorization trees

- use maximum # of primes in each list

WATCH The video for description

Primes

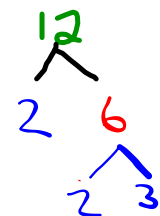
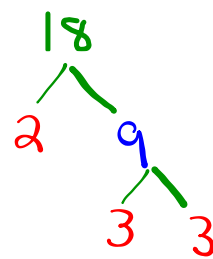
↳ 2, 3, 5, 7, 11, 13, ...

<https://www.khanacademy.org/math/algebra2/rational-expressions-equations-and-functions/adding-and-subtracting-rational-expressions/v/least-common-multiple-exercise>



Ex) GCF (18, 12) = ? 6

↳ common prime  
2, 3



$$\begin{aligned} \text{LCM}(18, 12) &= 3^2 \times 2^2 \\ &= 9 \times 4 \\ &= 36 \end{aligned}$$

$$\begin{aligned} 18 &\Rightarrow 2 \times 3 \times 3 \\ &= 2 \times 3^2 \end{aligned}$$

$$\begin{aligned} 12 &\Rightarrow 2 \times 2 \times 3 \\ &\Rightarrow 2^2 \times 3 \end{aligned}$$

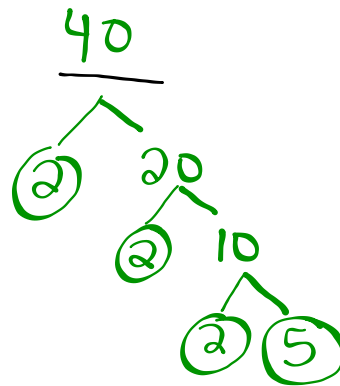
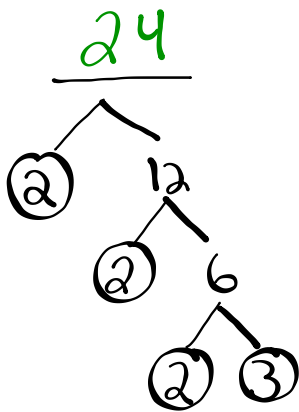
Both have  
so + take largest  
power of each

1)) Find the

- a) GCF ( 24, 40)    b) GCF (84, 60)    c) GCF (36, 90, 126)

1)) Find the

- a) LCM ( 15,40)    b) LCM (12,15)    c) LCM (9, 14, 63)



$$24 \Rightarrow 2 \times 2 \times 2 \times 3$$

$$= 2^3 \times 3$$

(Arrows point from the circled 2s in the first equation to the 2<sup>3</sup> in the second equation.)

GCF  
Circle  
common  
primes

$$40 \Rightarrow 2 \times 2 \times 2 \times 5$$

$$= 2^3 \times 5$$

(Arrows point from the circled 2s in the first equation to the 2<sup>3</sup> in the second equation.)

$$GCF(24, 40) = 2 \times 2 \times 2 = 8$$

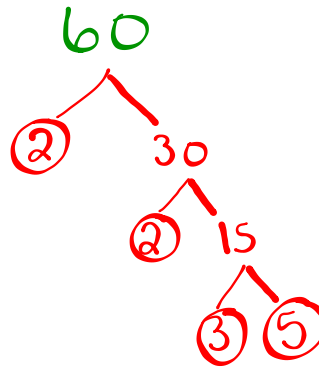
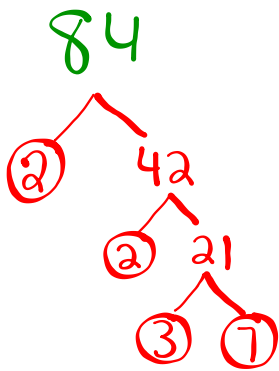
$$LCM(24, 40) = 2^3 \times 3 \times 5$$

$$= 8 \times 3 \times 5$$

$$= 120$$

Old way LCM  
24 →

Prime = 2, 3, 5, 7, 11, 13, ...



$$84 = 2 \times 2 \times 3 \times 7$$

$$= 2^2 \times 3 \times 7$$

$$60 \Rightarrow 2 \times 2 \times 3 \times 5$$

$$= 2^2 \times 3 \times 5$$

$$\text{GCF}(84, 60) = 2 \times 2 \times 3$$

$$= 4 \times 3$$

$$= 12$$

$$\text{LCM} = 2^2 \times 3 \times 7 \times 5$$

$$= 420$$

$$\text{LCM} \Rightarrow 420$$

$$84 \rightarrow 84, 168, 252, 336, 420, 504, \dots$$

$$60 \rightarrow 60, 120, 240, 300, 360, 420, \dots$$