Prime Numbers

Prime Numbers

A Prime Number can be divided evenly **only** by 1 & itself.
And it must be a whole number greater than 1.

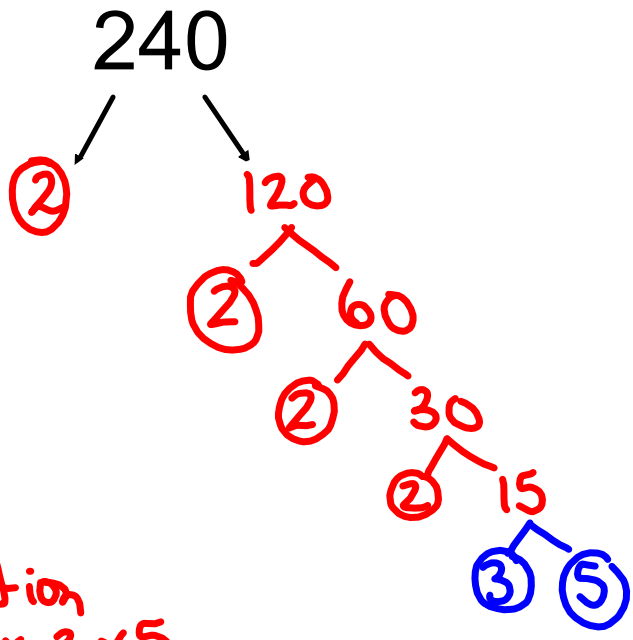
The first few prime numbers are 2, 3, 5, 7, 11, 13, 17 etc.....

Determining the Prime Factors of a Whole Number

2, 3, 5, 7, 11, 13, 17, 19, 23, . . .

Write the prime factorization of 240

Draw a Factor Tree !!



Prime factorization
$2 \times 2 \times 2 \times 2 \times 3 \times 5$
$2^4 \times 3 \times 5$

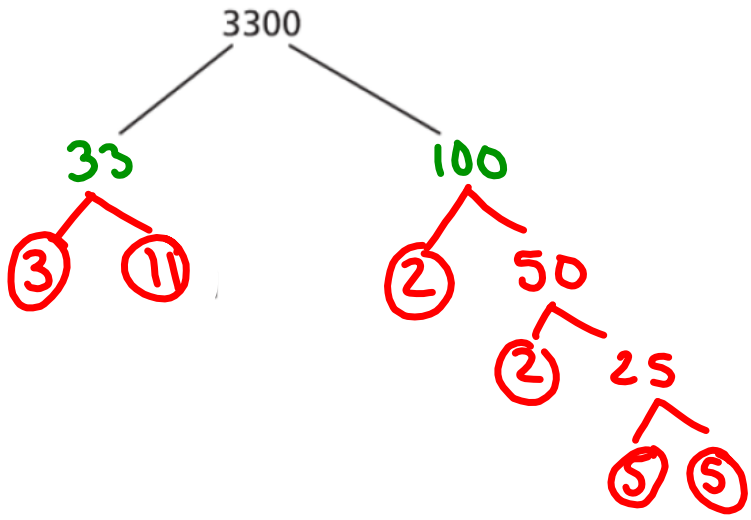
The Prime Factorization of 240 is:

$2 \times 2 \times 2 \times 3 \times 5 \times 2$ or $2^4 \times 3 \times 5$

The Prime Factors of 240 are:

2, 3, 5

Write the prime factorization of 3300 and the factors



The prime factors of 3300 are

The prime factorization of 3300 is:

or

Finding Factors

What is a "Factor" ?

Factors are the numbers you multiply together to get another number:

$2 \times 3 = 6$

Factor Factor

Sometimes we need to find all of the factors of a number:

12

1 X 12
2 X 6
3 X 4

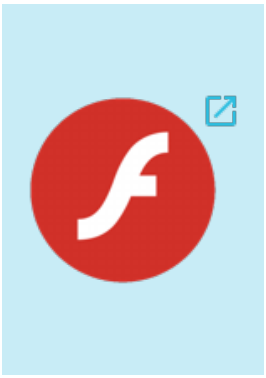
Find all the factors of 12:
the factors of 12 are 1, 2, 3, 4, 6, 12

Because:

Lets try some bigger numbers!

Determine all of the factors of 132

1 x 132
2 x 66
3 x 44
4 x 33
6 x 22
11 x 12



Lets try some bigger numbers!

Determine all of the factors of 132

$132 \div 1 = 132$
$132 \div 2 = 66$
$132 \div 3 = 44$
$132 \div 4 = 33$
$132 \div 6 = 22$
$132 \div 11 = 12$

These are the factors of 132!

The Factors of 132 are : 1, 2, 3, 4, 6, 11, 12, 22, 33, 44, 66, 132

Lets try some bigger numbers!

Determine all of the factors of 162

1 X 162
2 X 81
3 X 54
6 X 27
9 X 18

Factors (162): 1, 2, 3, 6, 9, 18, 27, 54 81, 162

Lets try some bigger numbers!

Determine all of the factors of 162

$162 \div 1 = 162$
$162 \div 2 = 81$
$162 \div 3 = 54$
$162 \div 6 = 27$
$162 \div 9 = 18$

These are the factors of 162!

The Factors of 162 are : 1, 2, 3, 6, 9, 18, 27, 54, 81, 162

GCF

When Comparing 2 or More Numbers....

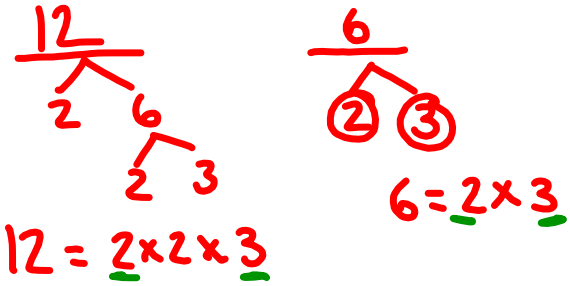
GCF - Greatest Common Factor

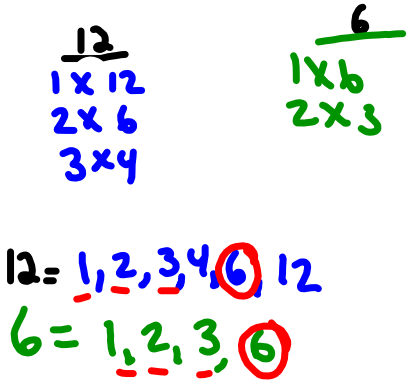
Is the largest COMMON number that will divide into each

- you can list the factors or use prime factorization trees

Prime Factorization

Ex) GCF (6,12) = 6





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

GCF = 2x3 = 6

LCM

When Comparing 2 or More Numbers....

LCM - Lowest Common Multiple

Is the largest COMMON multiple

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

or

use prime factorization trees

- use maximum # of primes in each list

WATCH The video for description

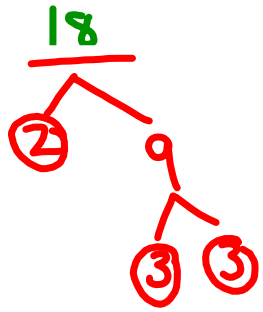
https://www.khanacademy.org/math/algebra2/rational-expressions-equations-and-functions/adding-and-subtracting-rational-expressions/v/least-common-multiple-exercise

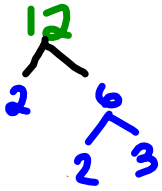
Prime Factorization

Ex) GCF (18,12) = ?

what's common

$2 \times 3 = 6$





$LCM(18,12) = 2^2 \times 3^2 = 4 \times 9 = 36$

$18 \Rightarrow 2 \times 3 \times 3 = 2 \times 3^2$

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

Both have so take largest power of each

1)) Find the

a) GCF (24, 40) b) GCF (84, 60) c) GCF (35, 90, 126)

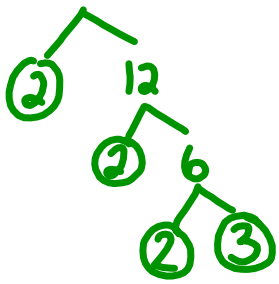
LCM(24, 40)

1)) Find the

GCF (15,40)

a) LCM (15,40) b) LCM (12,15) c) LCM (8, 14, 63)

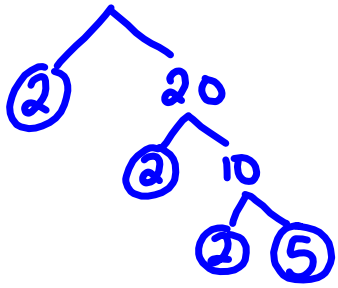
24



$24 = 2 \times 2 \times 2 \times 3$

$= 2^3 \times 3$

40



$40 = 2 \times 2 \times 2 \times 5$

$= 2^3 \times 5$

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

$= 8$

← for GCF → list primes and underline all that is common → multiply

$LCM(24,40) = 2^3 \times 3^1 \times 5^1$

$= 8 \times 3 \times 5$

$= 120$

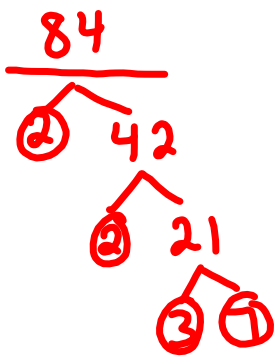
LCM

→ prime factorization of both #

→ list primes that differ (all)

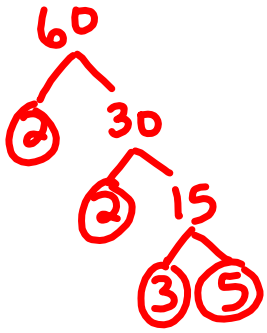
→ then place the exponent on to which has the largest amount of primes

→ multiply



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

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



$60 = 2 \times 2 \times 3 \times 5$

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

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

$= 12$

$LCM(84, 60) =$

$= 2^2 \times 3 \times 5 \times 7$

$= 4 \times 3 \times 5 \times 7$

$= 420$