Prime Numbers

Prime Numbers

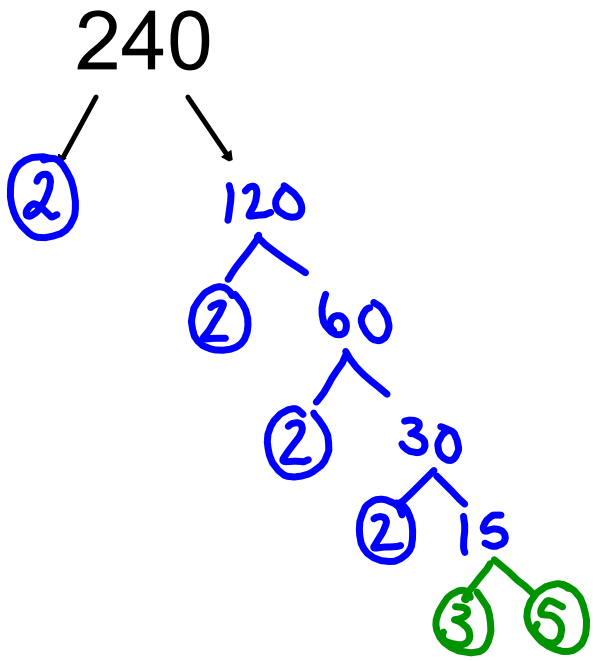
A Prime Number can be divided evenly **only** by 1 & itself.
And it must be a whole number greater than 1.

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

Determining the Prime Factors of a Whole Number

Write the prime factorization of 240

Draw a Factor Tree !!



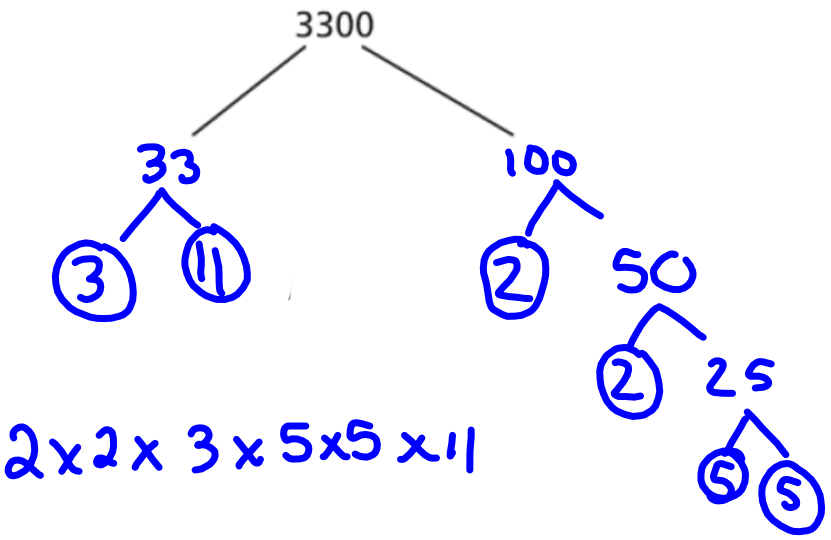
The Prime Factorization of 240 is:

$2 \times 2 \times 2 \times 2 \times 3 \times 5$ 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



$2 \times 2 \times 3 \times 5 \times 5 \times 11$

The prime factors of 3300 are 2, 3, 5, 11

The prime factorization of 3300 is:

or $2 \times 2 \times 3 \times 5 \times 5 \times 11$

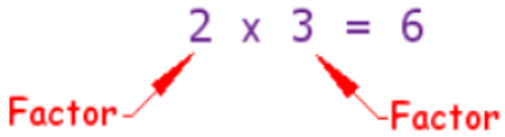
or

$2^2 \times 3 \times 5^2 \times 11$

Finding Factors

What is a "Factor" ?

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



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

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

Because: 1 x 12 = 12
2 x 6 = 12
3 x 4 = 12

24

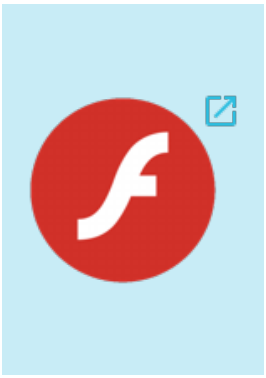
1 x 24
2 x 12
3 x 8
4 x 6

Factors of 24 ar 1, 2, 3, 4, 6, 8, 12, 24

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



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 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

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

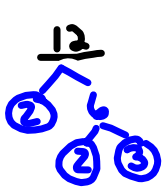
Is the largest COMMON number that will divide into each

- you can list the factors or use prime factorization trees

Prime Factorization

Ex) GCF (6,12) = 2x3 = 6

Both have 2 and 3



12 = 2x2x3

6 = 2x3

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

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

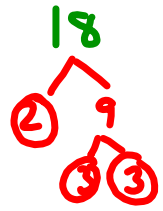
WATCH The video for description

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) = ? $2 \times 3 = 6$

LCM(18,12) = 36



$18 = 2 \times 3 \times 3$

$6 = 2 \times 2 \times 3$

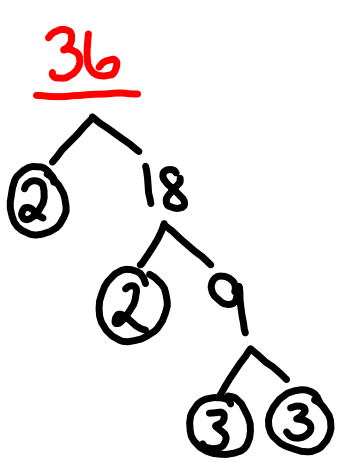
Primes → $2^2 \times 3^2$

$\Rightarrow 4 \times 9$

$\Rightarrow 36$

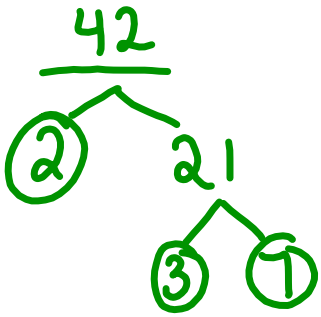
Both have so take largest power of each

GCF &LCM (36, 42)



$36 = 2 \times 2 \times 3 \times 3$

$= 2^2 \times 3^2$



$42 = 2 \times 3 \times 7$

GCF → underline #'s in common

$GCF(36,42) = 2 \times 3$

$= 6$

$LCM(36,42) = 2^2 \times 3^2 \times 7^1$

→ write down all primes used (2, 3, 7)

→ now write max # of each in any one

$LCM(36,42) = 4 \times 9 \times 7$

$= 252$

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)