Prime Numbers

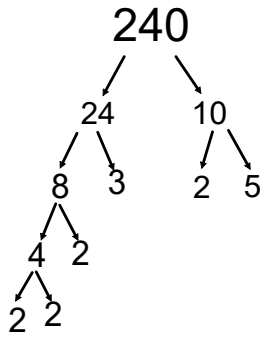
A Prime Number can be divided evenly **only** by 1 & itself.
And it must be a whole number greater than 1.

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

Determining the Prime Factors of a Whole Number

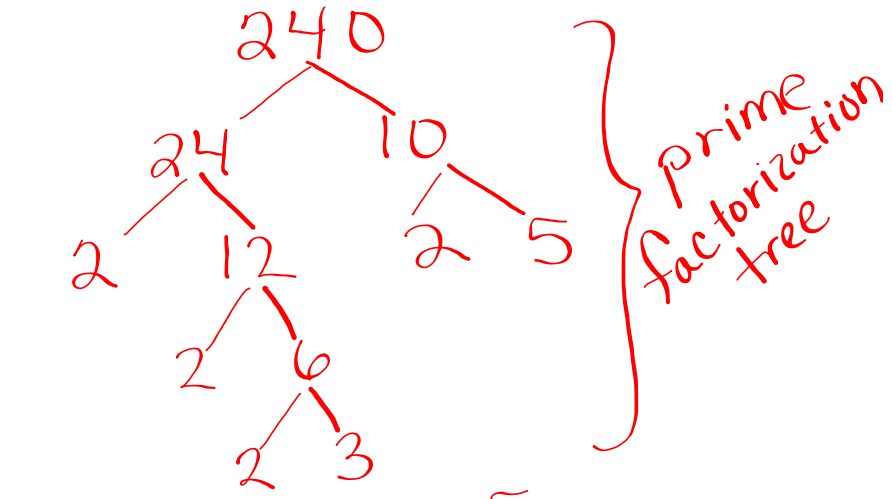
Write the prime factorization of 240

Draw a Factor Tree !!



The Prime Factorization of 240 is:
2 x 2 x 2 x 3 x 5 x 2 or 2^4 x 3 x 5

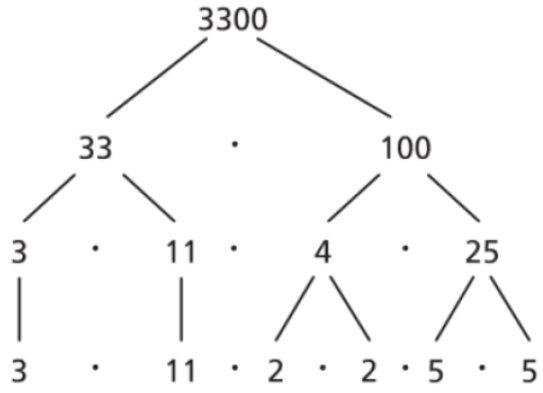
The Prime Factors of 240 are:
2, 3, & 5



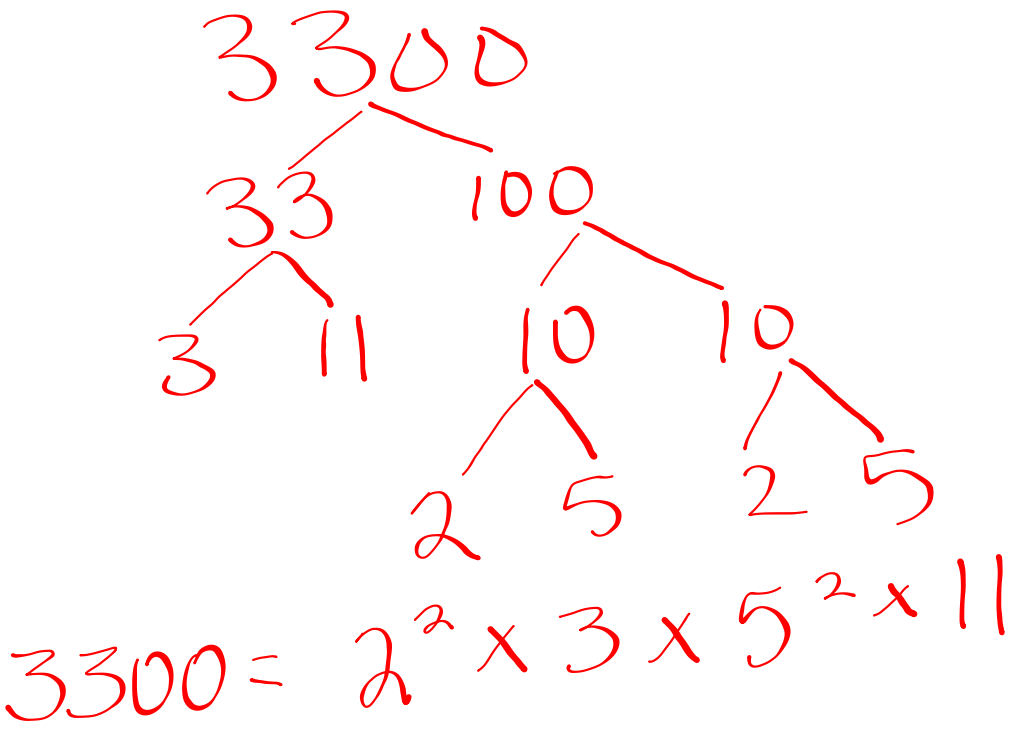
$240 = 2^4 \times 3 \times 5$

prime factors of 240 are: 2, 3, & 5

Write the prime factorization of 3300 and the factors



The prime factors of 3300 are 2, 3, 5, and 11.
The prime factorization of 3300 is: $2 \cdot 2 \cdot 3 \cdot 5 \cdot 5 \cdot 11$, or $2^2 \cdot 3 \cdot 5^2 \cdot 11$



Finding Factors

What is a "Factor" ?

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

2 x 3 = 6

Factor Factor

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

Lets try some bigger numbers!

Determine all of the factors of 132

132

1 x 132

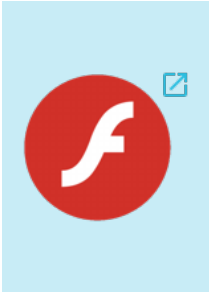
2 x 66

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

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

Review of GCF

Find the GCF for the following pairs of numbers:

1) 6 and 12

1 x 6
2 x 3

1 x 12
2 x 6
3 x 4

2) 6 and 21

3) 30 and 21

4) 144 and 126

144 :

126 :

LOOK for the Greatest Common Factor GCF

Find the GCF of 36 and 54.

The factors of 36 are **1**, **2**, **3**, 4, **6**, **9**, 12, **18**, and 36.

The factors of 54 are **1**, **2**, **3**, **6**, **9**, **18**, 27, and 54.

The **common factors** of 36 and 54 are **1, 2, 3, 6, 9, 18**

Although the numbers in **bold** are all common factors of both 36 and 54, **18** is the greatest common factor.

Using Prime Factors to Solve GCF of Numbers

Prime factors to find GCF.

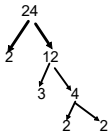
Steps:
1) Find the prime factors of each number

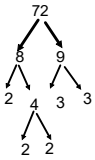
2) Compare the prime factors of each number

3) Circle the prime factors that each number has in common

4) Multiply common prime factors together to get GCF of #'s

Example:
Find the GCF of 24 and 72



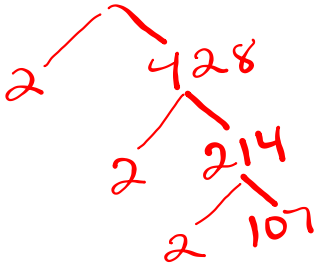


24 = 2 x 2 x 2 x 3
72 = 2 x 2 x 2 x 3 x 3

GCF =

$2^3 \times 3 = 24$

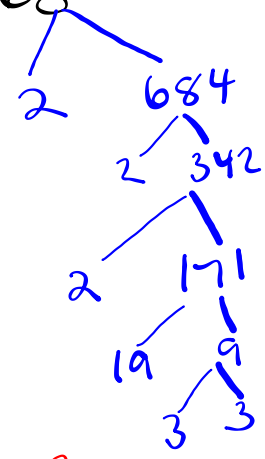
856



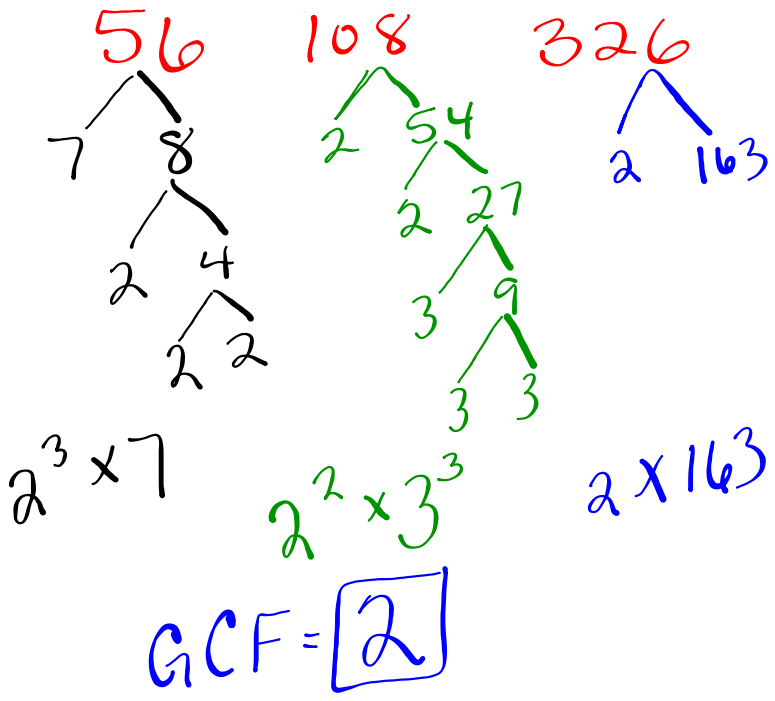
$2^3 \times 107$

$2^3 = 8$

1368



$2^3 \times 3^2 \times 19$



GCF = $\boxed{2}$

4. a b c
5. a b c
6. a b c
8. a b c
9. a b