

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.

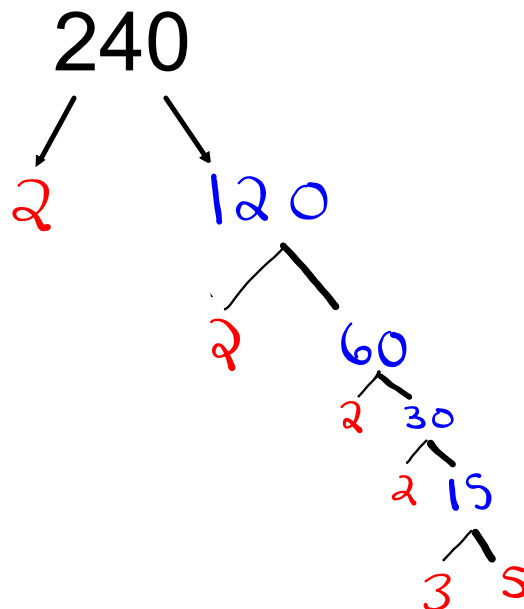
The first few prime numbers are 2, 3, 5, 7, 11, 13, 17 etc.....

Determining the Prime Factors of a Whole Number

Prime # $\rightarrow 2, 3, 5, 7, 11, \dots$

Write the prime factorization of 240

Draw a Factor
Tree !!



The Prime Factorization of 240 is:

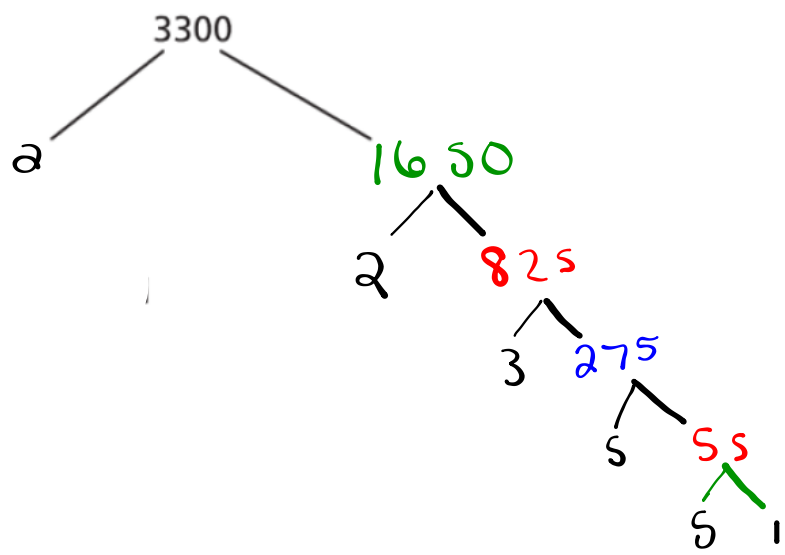
$$2 \times 2 \times 2 \times 3 \times 5 \times 2 \quad \text{or} \quad 2^4 \times 3 \times 5$$

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

The Prime Factors of 240 are:

2, 3, 5

Write the prime factorization of 3300 and the factors



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

The prime factorization of 3300 is:

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:

$$\begin{array}{c} 2 \times 3 = 6 \\ \text{Factor} \nearrow \qquad \searrow \text{Factor} \end{array}$$

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: $1 \times 12 = 12$
 $2 \times 6 = 12$
 $3 \times 4 = 12$

Lets try some bigger numbers!

Determine all of the factors of 132

$$1 \times 132$$

$$2 \times 66$$

$$3 \times 44$$

$$4 \times 33$$

$$6 \times 22$$

$$11 \times 12$$

Stop checking after $\sqrt{132} \approx 11.48$

Stop
at

11

132 \rightarrow 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

162
^

$$1 \times 162$$

$$2 \times 81$$

$$3 \times 54$$

$$6 \times 27$$

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