

Chapter #3 FACTORS & PRODUCTS

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3.1 Factors & Multiples of Whole Numbers

Factor : to factor means to write as a product

ex. $20 \Rightarrow 2 \cdot 2 \cdot 5$

use dots to represent multiplication (x)

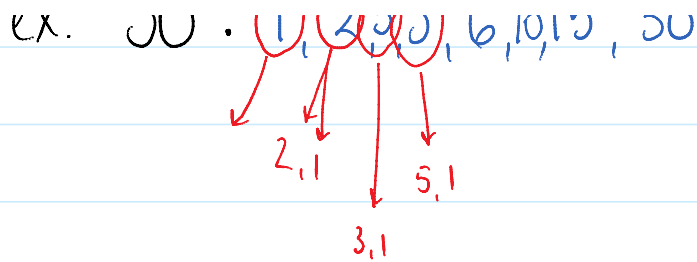
Prime factorization : of a natural # is the # written as a product of its prime factors

Prime Numbers : a whole # with exactly 2 factors, itself and 1

ex. $2 : 1, 2 \checkmark$
 $3 : 1, 3 \checkmark$
 ~~$4 : 1, 2, 4$~~
 $5 : 1, 5 \checkmark$
 ~~$6 : 1, 2, 3, 6$~~

Prime factor : a prime # that is a factor of a #

ex. $30 : \textcircled{1}, \textcircled{2}, \textcircled{3}, \textcircled{5}, 6, 10, 15, 30$



composite number: a number with 3 or more factors

ex. 8: 1, 2, 4, 8

Greatest Common Factor (GCF): the greatest factor of 2 or more #'s that the numbers have in common

Ex. #1 Determine the GCF of 126 and 144

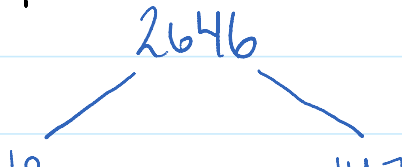
126
 1 · 126
 2 · 63
 3 · 42
 6 · 21
 7 · 18
 9 · 14

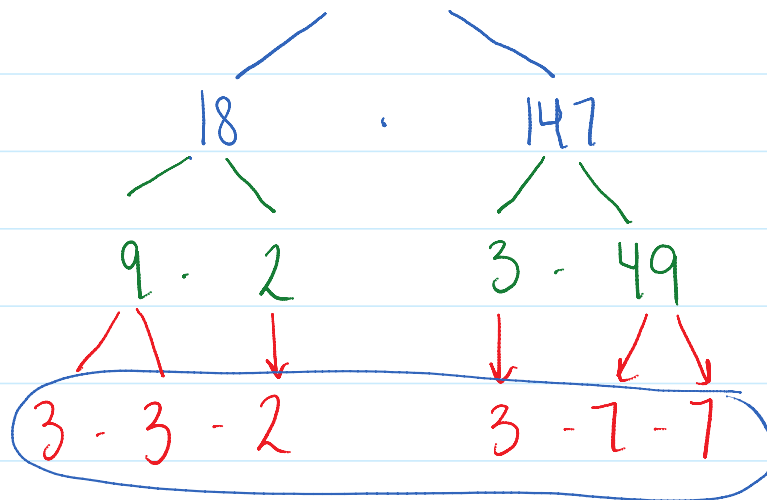
144
 1 · 144
 2 · 72
 3 · 48
 4 · 36
 6 · 24
 8 · 18
 9 · 16

GCF: 18

Ex. #2 Write the prime factorization of 2646

Draw a factor tree





Prime factors of 2646 are: 2, 3, 7

Prime factorization of 2646 is: $2 \cdot 3 \cdot 3 \cdot 3 \cdot 7 \cdot 7$
 or $2 \cdot 3^3 \cdot 7^2$

Multiple: the product (answer when you multiply) of a given # and a natural #

ex. 8 : 8, 16, 24, ...

$\xrightarrow{\times 1}$
 $\xrightarrow{\times 2}$
 $\xrightarrow{\times 3}$

Least common multiple: the smallest # that is divisible by 2 or more #'s

ex. #3 Determine the LCM of 28, 42, and 63

28 : 28, 56, 84, 112, 140, 168, 196, 224, 252...

42 : 64, 126, 168, 210, 252...

63 : 63, 126, 189, 252...

LCM: 252