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Factors & Multiples: Notes

Factors vs. Multiples!

Factors: numbers multiplied together to get the answer

Example: $3 \times 4 = 12$

↳ The factors of 12 are 3 and 4

* Numbers can have more than 2 factors
  ↳ For example the factors of 12 are 1, 2, 3, 4, 6, 12
  because
  $1 \times 12 = 12$ $2 \times 6 = 12$ $3 \times 4 = 12$

Multiples: the answer when you multiply a number by an integer

Example: 15 is a multiple of 5
b/c $5 \times 3 = 15$

* In a multiplication table, all those answers are multiples of the numbers that they are in the row or column in

Example: Multiples of 2:
2, 4, 6, 8, 10, 12, ...

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Prime vs. Composite Numbers!

Prime: numbers that have 2 factors: 1 and themselves

Example: 5 is prime

Factors: 1, 5

Composite: numbers that are not prime or have more than 2 factors

Example: 12 is composite

Factors: 1, 2, 3, 4, 6, 12

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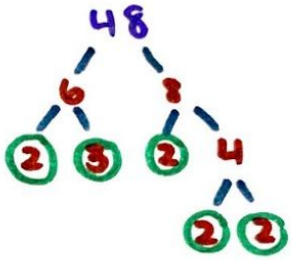
Prime Factorization!

Prime Factorization: Finding all the prime numbers that multiply together to get the original # / answer

the best way to prime factorize is by using a factor tree.

Find the Prime Factorization for 48.

1. Write the original # at the top.
2. Find 2 factors for the # on top and write the # underneath w/ a line connected.
3. If one or both of the numbers are prime, then circle them or else continue factoring each number at the end of each branch
4. Repeat step 3 till all the numbers connected to a bottom branch are circled / prime.
5. Write all the prime numbers together multiplied regularly or as exponents. (write them from least to greatest depending on the root.)

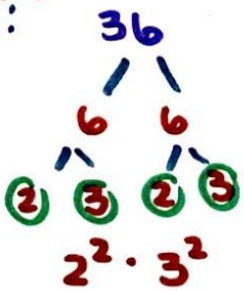


$2 \cdot 2 \cdot 2 \cdot 2 \cdot 3$

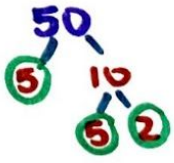
or

$2^4 \cdot 3$

Examples:



$2^2 \cdot 3^2$



$2 \cdot 5^2$

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Least Common Multiple & Greatest Common Factor!

Least Common Multiple (LCM): the smallest # that is divisible by 2 or more given #s

Example: What is the LCM of 3 and 4?
Answer: 12
Bc that is the smallest multiple that both 3 & 4 have

* A way to find the LCM is to list all the multiples, then find the smallest # that they have in common.

Greatest Common Factor (GCF): the largest number that 2 or more given #s can be divided by

Example: What is the GCF of 12 and 18?
Answer: 6
Bc that is the largest number that both 12 and 18 can be divided by

* A way to find the GCF is to list all the factors or even prime factorizations of each given number, then find the largest # that they have in common.