

AIM: 4-1 I will be able to write the prime factorization of composite numbers!

Name _____
Mrs. Ashley

Date _____
Math 6 - Period _____

KEY CONCEPT 1: Prime and Composite Numbers

Prime Number - A whole number greater than 1 that is divisible by only the numbers 1 and itself. (Examples: 2, 3, 5, 7, 11, 19, 43...) $2: 1 \cdot 2$ $11: 1 \cdot 11$

Composite Number - A whole number greater than 1 that is divisible by more than two numbers. (Examples: 6, 10, 12, 100...) $6: 1 \cdot 6$
 $2 \cdot 3$ (4 Factors)

****The numbers 0 and 1 are neither prime nor composite****

Examples of PRIME NUMBERS	Examples of COMPOSITE NUMBERS
3 $1 \cdot 3 = 3$	4 $1 \cdot 4 = 4$ $2 \cdot 2 = 4$ Factors: 1, 2, 4
5 $1 \cdot 5 = 5$	14 $1 \cdot 14 = 14$ $2 \cdot 7 = 14$ Factors: 1, 2, 7, 14
19 $1 \cdot 19 = 19$	25 $1 \cdot 25 = 25$ $5 \cdot 5 = 25$ Factors: 1, 5, 25
43 $1 \cdot 43 = 43$	49 $1 \cdot 49 = 49$ $7 \cdot 7 = 49$ Factors: 1, 7, 49

Now You Try: Shade in the squares below that have prime numbers to create a picture!

odd #s: 1, 3, 5, 7, 9
even #s: 2, 4, 6, 8, 0

4	20	13	6	12
18	11	31	7	50
47	19	29	41	2
22	45	23	8	10

* 2 is the only even prime #
(all other evens are composite)

KEY CONCEPT 2: Prime Factorization

Whole numbers that are multiplied together to find a product are called Factors

$$\begin{array}{ccc}
 2 \cdot 3 = 6 \\
 \underbrace{} \quad \downarrow \\
 \text{Factors} \quad \text{Product}
 \end{array}$$

Finding Factors: List all of the factors of each number. (make a chart)
 Always start with 1.

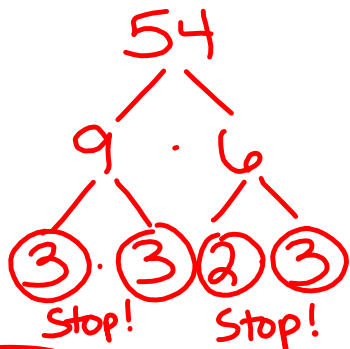
1	18
2	9
3	6

1	24
2	12
3	8
4	6

Factors: 1, 2, 3, 6, 9, 18 1, 2, 3, 4, 6, 8, 12, 24

Prime Factorization: When we write a number as the product of its prime factors. (Factor tree)

Example: Write the prime factorization of the number 54.
 *Circle prime #'s



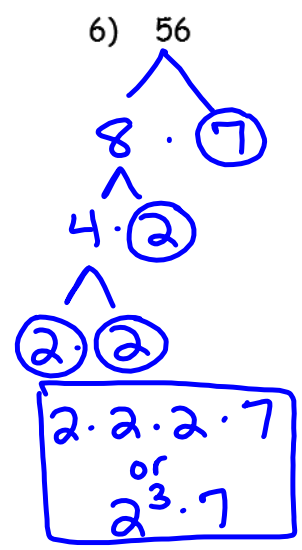
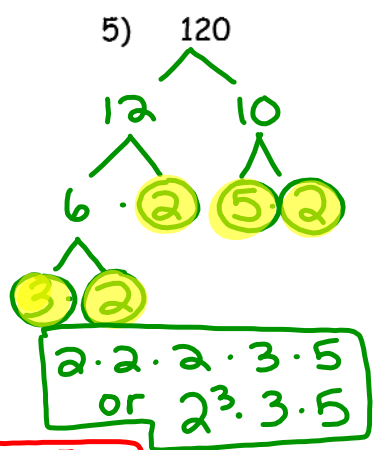
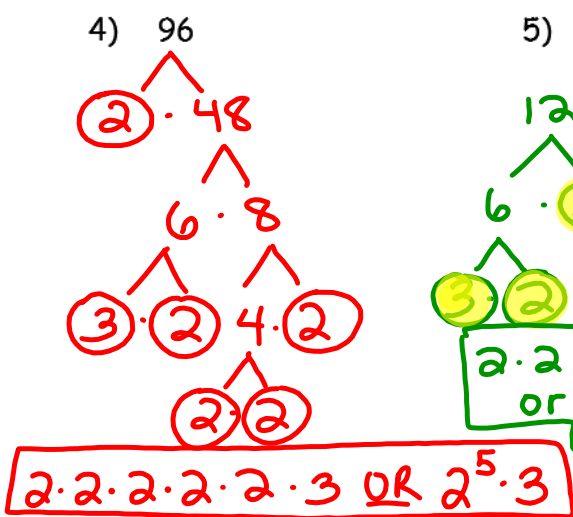
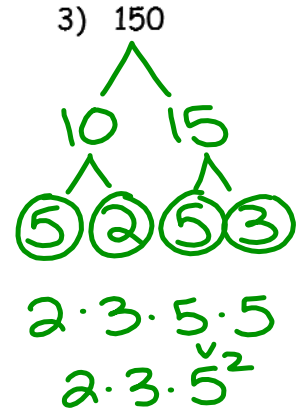
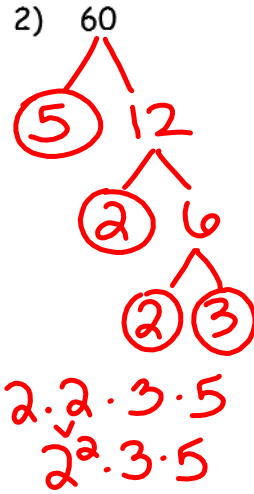
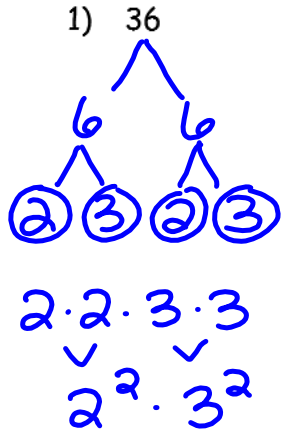
Answer: $\underline{2 \cdot 3 \cdot 3 \cdot 3}$
 or
 $\underline{2 \cdot 3^3}$

Check: $2 \cdot 3 \cdot 3 \cdot 3$
 $\begin{array}{c} \vee \quad \vee \\ 6 \quad 9 \\ \vee \quad \vee \\ 54 \checkmark \end{array}$

*only prime #'s allowed in your answer!



Now You Try: Choose 3 of your favorite problems below. Write the prime factorization



Let's Summarize!

a) How do you know when you have found the prime factorization of a number?

When all the factors are prime. (the factors are only 1 and itself)

b) What number has a prime factorization of $2 \times 5 \times 5$?

\checkmark
 $\underline{\underline{50}}$

