

Name: _____

Period: _____

Date: _____

Math Unit 1: Numerical Expressions and Factors**Lesson 1.4- Prime Factorization****SWBAT:****Paraphrase:****Essential Question:** Without dividing, how can you tell when a number is divisible by another number?

Vocabulary

Prime number-

Composite number-

***0 and 1 are NEITHER prime NOR composite!**

Example 1

The brass section of a marching band has 30 members. The band director arranges the brass section in rows. Each row has the same number of members. How many possible arrangements are there?

Use the factor pairs of 30 to find the number of arrangements.

$30 = 1 \cdot 30$ There could be 1 row of 30 or 30 rows of 1.

$30 = 2 \cdot 15$ There could be 2 rows of 15 or 15 rows of 2.

$30 = 3 \cdot 10$ There could be 3 rows of 10 or 10 rows of 3.

$30 = 5 \cdot 6$ There could be 5 rows of 6 or 6 rows of 5.

$30 = 6 \cdot 5$ The factors 5 and 6 are already listed.

••• There are 8 possible arrangements: 1 row of 30, 30 rows of 1, 2 rows of 15, 15 rows of 2, 3 rows of 10, 10 rows of 3, 5 rows of 6, or 6 rows of 5.

Your Turn

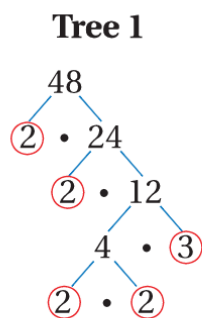
There are 40 members in the book club at school. Each member sits at a desk. Each row needs to have the same number of desks. How many possible arrangements are there?

List the factor pairs of the number.**1.** 18**2.** 24**3.** 51

Example 2

Write the prime factorization of 48.

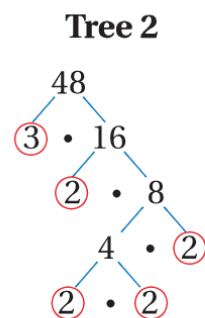
Choose any factor pair of 48 to begin the factor tree.



Find a factor pair and draw "branches."

Circle the prime factors as you find them.

Find factors until each branch ends at a prime factor.



$$48 = 2 \cdot 2 \cdot 3 \cdot 2 \cdot 2$$

$$48 = 3 \cdot 2 \cdot 2 \cdot 2 \cdot 2$$

∴ The prime factorization of 48 is $2 \cdot 2 \cdot 2 \cdot 2 \cdot 3$, or $2^4 \cdot 3$.

Your Turn

Write the prime factorization of 45.

Write the prime factorization of the number.

5. 20

6. 88

7. 90

8. 462

Notes /
Questions