Name _____

Alternative Lesson 5-2

Prime Factorization

Every whole number greater than 1 is either a **prime number** or a **composite number**. A prime number has exactly two factors: 1 and itself. A composite number has more than two factors. The numbers 0 and 1 are neither prime nor composite.

Example 1

The factors of 185 are 1, 5, 37, and 185.
Is 185 a prime number or a composite number?

Since there are more than two factors of 185, the number is a composite number.

Try It Given the number and its factors, tell whether it is prime or composite.

a. 25: 1, 5, 25 _____

b. 83: 1, 83 _____

c. 54: 1, 2, 3, 6, 9, 18, 27, 54 _____

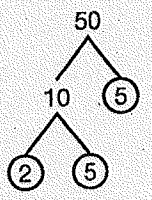
d. 68: 1, 2, 4, 17, 34, 68 _____

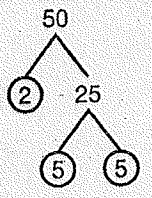
Example 2

Write the prime factorization of 50. Tell whether it is prime or composite.

To decide if a number is prime or composite, you need to find the factors. You can use a factor tree to find the prime factors. If the prime factorization is 1 × the number, the number is a prime number. If the prime factorization is **not** 1 × the number, the number is a composite number.

Here are two factor trees that show the prime factors of 50.





You get the same prime factors each way.

$50 = 2 \times 5 \times 5 \leftarrow$ Prime Factorization

Since the prime factorization is **not** 1 × the number, 50 is a composite number.

Try It Write the prime factorization of each number. Then tell whether the number is prime or composite.

e. 18 = _____

f. 23 = _____

g. 27 = _____

h. 60 = _____

i. 93 = _____

j. 115 = _____

Name