

LESSON

9-2

Prime Factorization**Reteach**

Factors of a product are the numbers that are multiplied to give that product.

A factor is also a whole number that divides the product with no remainder.

To find all of the factors of 32, make a list of multiplication facts.

$$1 \cdot 32 = 32$$

$$2 \cdot 16 = 32$$

$$4 \cdot 8 = 32$$

The factors of 32 are 1, 2, 4, 8, 16, and 32.

Write multiplication facts to find the factors of each number.

1. 28

2. 15

3. 36

4. 29

A number written as the product of prime factors is called the **prime factorization** of the number.

To write the prime factorization of 32, first write it as the product of two numbers. Then, rewrite each factor as the product of two numbers until all of the factors are prime numbers.

$$32 = 2 \cdot 16 \quad (\text{Write 32 as the product of 2 numbers.})$$

$$= 2 \cdot 4 \cdot 4 \quad (\text{Rewrite 16 as the product of 2 numbers.})$$

$$\begin{array}{cc} \downarrow & \downarrow \end{array}$$

$$= 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \quad (\text{Rewrite the 4's as the product 2 prime numbers.})$$

So, the prime factorization of 32 is $2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$ or 2^5 .

Find the prime factorization of each number.

5. 28

6. 45

7. 50

8. 72
