

# Greatest Common Factor (pages 150–153)

The **greatest common factor (GCF)** of two or more numbers is the greatest number that is a factor of each number.

## Finding the Greatest Common Factor

To find the GCF of two or more numbers:

- Method 1: List the factors of each number and then identify the common factors. The greatest of these common factors is the GCF.
- Method 2: Write the prime factorization of each number. Then identify all common prime factors and find their product, which is the GCF.

## EXAMPLES

**A** Find the GCF of 12, 20, and 36 by listing factors.

factors of 12: **1, 2, 3, 4, 6, 12**

factors of 20: **1, 2, 4, 5, 10, 20**

factors of 36: **1, 2, 3, 4, 6, 9, 12, 18, 36**

The greatest of the common factors is 4, which is the GCF of 12, 20, and 36.

**B** Find the GCF of 27 and 90 by using prime factorization.

prime factorization of 27:  $3 \times 3 \times 3$

prime factorization of 90:  $2 \times 3 \times 3 \times 5$

The common prime factors are 3 and 3. Their product is 9. The GCF of 27 and 90 is 9.

## Try These Together

1. Find the GCF of 12 and 16 by listing factors.

*HINT: Circle the factors common to 12 and 16. Then choose the greatest of those circled.*

2. Find the GCF of  $15 = 3 \times 5$  and  $50 = 2 \times 5^2$  by listing common prime factors.

*HINT: There is only one common prime factor.*

## PRACTICE

**Find the GCF of each set of numbers by listing factors.**

3. 54, 81

4. 72, 90

5. 132, 144

6. 20, 36, 44

**Find the GCF of each set of numbers by listing common prime factors.**

7.  $9 = 3^2$

$36 = 2^2 \times 3^2$

8.  $45 = 3^2 \times 5$

$81 = 3^4$

**Find the GCF of each set of numbers by writing prime factorizations.**

9. 12, 48

10. 36, 54

11. 60, 42

**12. Life Science** The smallest adult male gorillas weigh about 135 kilograms. The smallest adult female gorillas weigh about 70 kilograms. What is the greatest common factor of these two numbers?



**13. Standardized Test Practice** Find the greatest common factor of 96 and 360.

**A** 5

**B** 12

**C** 36

**D** 24

Answers: 1. 4 2. 5 3. 27 4. 18 5. 12 6. 4 7. 9 8. 9 9. 12 10. 18 11. 6 12. 5 13. D