Divisibility

**Lesson 4-1**

**Why?** You need to find factors of numbers when operating with fractions.

<table>
<thead>
<tr>
<th>A number is divisible by . . .</th>
<th>Example</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 if the last digit is even (0, 2, 4, 6, or 8).</td>
<td>176</td>
<td>6 is even.</td>
</tr>
<tr>
<td>3 if the sum of the digits is divisible by 3.</td>
<td>525</td>
<td>$5 + 2 + 5 = 12$; 12 is divisible by 3.</td>
</tr>
<tr>
<td>4 if the last two digits form a number divisible by 4.</td>
<td>3,516</td>
<td>16 is divisible by 4.</td>
</tr>
<tr>
<td>5 if the last digit is 0 or 5.</td>
<td>11,275</td>
<td>The last digit is 5.</td>
</tr>
<tr>
<td>6 if the number is divisible by both 2 and 3.</td>
<td>24</td>
<td>24 is divisible by both 2 and 3.</td>
</tr>
<tr>
<td>9 if the sum of the digits is divisible by 9.</td>
<td>4,860</td>
<td>$4 + 8 + 6 + 0 = 18$; 18 is divisible by 9.</td>
</tr>
<tr>
<td>10 if the last digit is 0.</td>
<td>35,390</td>
<td>The last digit is 0.</td>
</tr>
</tbody>
</table>

Factors and Prime Factorization

**Lesson 4-2**

**Why?** Prime factorization is used to operate with and simplify fractions.

A prime number is greater than 1 and has factors of only 1 and itself: 2, 3, 5, 7, 11, . . .

A composite number is greater than 1 and is not prime: 4, 6, 8, 9, 10, . . .

Write the prime factorization of 84.

Use a **factor tree**.

Use a **ladder diagram**.

The number 84 is composite.

$84 = 2 \cdot 2 \cdot 3 \cdot 7$ The factors 2, 3, and 7 are prime.

Greatest Common Factor

**Lesson 4-3**

**Why?** Finding the GCF of a set of numbers is used in operations with fractions.

Find the GCF of 24 and 60.

**Method 1**

Factors of 24: 1, 2, 3, 4, 6, 8, (12) 24
Factors of 60: 1, 2, 3, 4, 5, 6, 10, (12) 15, 20, 30, 60

List all the factors of each number. Circle the greatest common factor.

**Method 2**

$24 = 2 \cdot 2 \cdot 3$

$60 = 2 \cdot 2 \cdot 3 \cdot 5$

$2 \cdot 2 \cdot 3 = 12$

Write the prime factorization of each number. Circle the common prime factors.

Find the product of the common prime factors.

The greatest common factor of 24 and 60 is 12.