Here are some words which are frequently used

- **terms**: numbers being added or subtracted
- **product**: the result of a multiplication
- **factors**: numbers which divide exactly into another number
- **quotient**: the result of a division
- **divisor**: the number by which we divide
- **dividend**: the number being divided

**MULTIPLES**

A multiple of any counting number is obtained by multiplying it by another counting number.

For example, the multiples of 3 are: 3, 6, 9, 12, 15, 18, ...... and these are obtained by multiplying 3 by each of the counting numbers in turn,

i.e., \( 3 \times 1 = 3, \ 3 \times 2 = 6, \ 3 \times 3 = 9, \ 3 \times 4 = 12, \ etc. \)

**EXERCISE A**

1. List all the factors of:
   - a 9
   - b 12
   - c 19
   - d 60
   - e 23
   - f 48
   - g 49
   - h 84

2. List the first five multiples of:
   - a 4
   - b 7
   - c 9
   - d 15

**Example 1**

- a Find the largest multiple of 9 less than 500.
- b Find the smallest multiple of 11 greater than 1000.

<table>
<thead>
<tr>
<th>a</th>
<th>b</th>
</tr>
</thead>
<tbody>
<tr>
<td>( 9 )</td>
<td>( 11 )</td>
</tr>
<tr>
<td>( \underline{5080} )</td>
<td>( \underline{10040} )</td>
</tr>
<tr>
<td>( 5 )</td>
<td>( 9 )</td>
</tr>
</tbody>
</table>

with 5 remainder

with 10 remainder

So, the largest multiple is

\( 9 \times 55 = 495. \)

So, the smallest multiple is

\( 11 \times 91 = 1001. \)

3. a Find the largest multiple of 7 which is less than 1000.
   b Find the smallest multiple of 13 which is greater than 1000.
   c Find the largest multiple of 17 which is less than 2000.
   d Find the smallest multiple of 15 which is greater than 10000.
**Divisibility**

One number is divisible by another if, when we divide, the answer is a whole number.

The following divisibility tests should be kept in mind when looking for prime factors:

<table>
<thead>
<tr>
<th>A natural number is divisible by</th>
<th>2</th>
<th>if the last digit is even or 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td></td>
<td>if the sum of the digits is divisible by 3</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>if the last two digits are divisible by 4</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>if the last digit is 0 or 5</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>if the number is even and divisible by 3.</td>
</tr>
</tbody>
</table>

**EXERCISE B**

1. Which of the following are divisible by:
   
<table>
<thead>
<tr>
<th>i</th>
<th>ii</th>
<th>iii</th>
<th>iv</th>
<th>v</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>1002</td>
<td>b</td>
<td>12345</td>
<td>c</td>
</tr>
<tr>
<td>f</td>
<td>6039</td>
<td>g</td>
<td>91839</td>
<td>h</td>
</tr>
</tbody>
</table>

**Example 4**

Find □ if 53□ is divisible by: a 2 b 5 c 4 d 3

- a To be divisible by 2, □ must be even or 0. \(\therefore □ = 0, 2, 4, 6, 8\)
- b To be divisible by 5, □ must be 0 or 5. \(\therefore □ = 0\) or 5
- c To be divisible by 4, ‘3□’ must be divisible by 4. 
  \(\therefore □ = 2\) or 6 \(\{\text{as 32 and 36 are divisible by 4}\}\)
- d To be divisible by 3, \(5 + 3 + □\) must be divisible by 3. 
  \(\therefore □ = 1, 4\) or 7 \(\{\text{as the number must be 9, 12 or 15}\}\)

2. Find □ if the following are divisible by 2:
   
   a 43□ b 592□ c 3□6 d □13

3. Find □ if the following are divisible by 3:
   
   a 31□ b 2□3 c □42 d 32□5

4. Find □ if the following are divisible by 4:
   
   a 42□ b 3□4 c 514□ d 68□0

5. Find □ if the following are divisible by 5:
   
   a 39□ b 896□ c 73□5 d 64□2

7. Find the digits X and Y if the number of form ‘X7Y6’ is divisible by 24.

8. Find the largest three digit number divisible by 3 and 4.