**A line segment** is a set of points and has a specific length, i.e., it does not extend indefinitely.

A line segment is named by two points on the line segment with a line segment symbol above the letters.

The line segment always has a certain length that can be measured using a ruler.

**Ruler Postulate**

Every point on a line can be paired with a real number. This makes a one-to-one correspondence between the points on

the line and the real numbers. The real number that corresponds to a point is called **the coordinate of the point.**

**Sample Problem 1**: **Find the length of each segment using a ruler.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **a.** |  | **b.** |  | **c.** |  |
|  |  |  |  |  |  |

**Finding the length of line segment using number line**

The distance between points on a number line represent the length of the line segment.

The distance between any two points is the absolute value of the difference of the coordinates.

If the coordinates of points and are and , then the distance between and is:

or

Two line segments with the same lengths are said to be **congruent line segments.**

**Sample Problem 1**: **Find the length of each segment using the number line.** **Determine which segments аrе congruent.**

|  |  |
| --- | --- |
| **a.** | **0**  **1**  **2**  **3**  **4**  **-1**  **-2**  **-3**  **-4**  **5**  **6**  **-5**  **-6** |
|  |  |
| **b.** | **0**  **1**  **2**  **3**  **4**  **-1**  **-2**  **-3**  **-4**  **5**  **6**  **-5**  **-6** |
|  |  |

**Segment Addition Postulate:**

**If three points, , and are collinear and is between and, then the distance is the sum of distance and .**

**Sample Problem 3:** **Find the length of each segment using a segment addition postulate.** **Draw a diagram to represent the situation.**

|  |  |  |  |
| --- | --- | --- | --- |
| **a.** | Point is between pointsand  The points are collinear. |  |  |
| **b.** | Point is between pointsand  The points are collinear. |  |  |

**The midpoint** is the middle point of a line segment. It is equidistant from both endpoints, and it is the centroid both of the segment and of the endpoints.

The midpoint of a segment divides the segment into two congruent segments.

**A segment bisector** is a point, line or a line segment that passes through a midpoint of another segment.

A segment bisector is usually at the center of the line segment and always includes the midpoint of the line segment.

**Sample Problem 4:** **Find the length of each segment. Draw a diagram to represent the situation.**

|  |  |  |  |
| --- | --- | --- | --- |
| **a.** | Point is a midpoint of segment |  |  |
| **b.** | Point is a midpoint of segment |  |  |

**Sample Problem 5:** **Find the coordinate of the midpoint of each segment.**

|  |  |  |
| --- | --- | --- |
| **a.** | **3**  **4**  **2**  **1**  **0**  **-1**  **-2**  **-3** | The coordinate of the midpoint ofis |
| **b.** | **3**  **4**  **2**  **1**  **0**  **-1**  **-2**  **-3** | The coordinate of the midpoint ofis |

**A segment partition** is a point, line or a line segment that partitions the line segment in a particular ratio.

If the ratio is equal, the segment partition becomes a segment bisector.

**Sample Problem 6:** **Divide the line segment in the ratio given by putting a dot at the partition.**

|  |  |  |
| --- | --- | --- |
| **a.** |  |  |
| **b.** |  |  |