

Student Objectives:

- The student will be able to calculate distance and midpoint between two points.
- The student will be able to apply the definition of a midpoint to calculate length of a segment.
- The student will be able to recall definitions of angle, circle, perpendicular line, parallel lines, and line segment, based on understanding definitions of point, line, distance along a line, and distance around a circular arc.
- The student will be able to make formal geometric construction with a variety of tools and methods.

Distance:

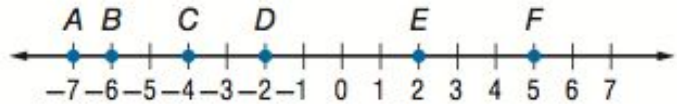
1. Use the number line to find:

a.  $BE =$

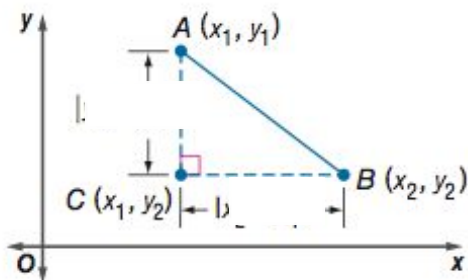
b.  $AC =$

c.  $CF =$

d.  $FB =$

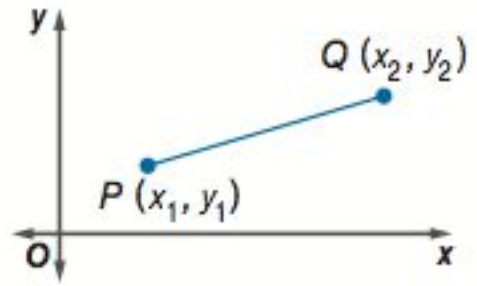


Prove distance formula



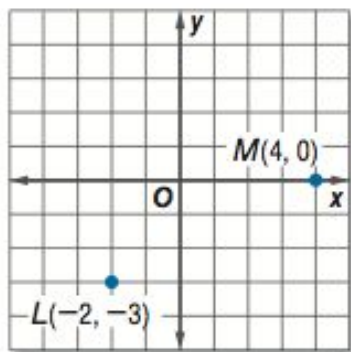
Geometry  
1.3 Distance and Midpoints

**Distance Formula:**

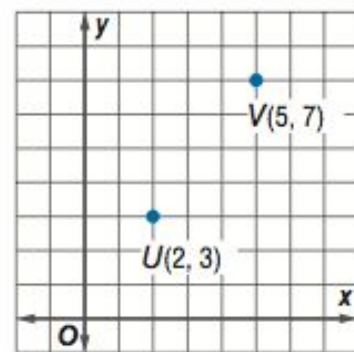


2. Find the distance between each pair of points:

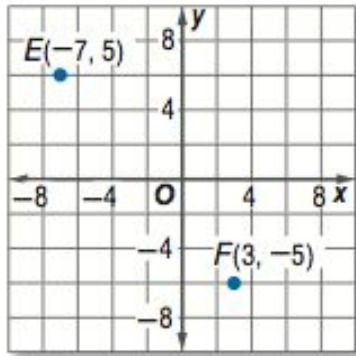
a.



b.

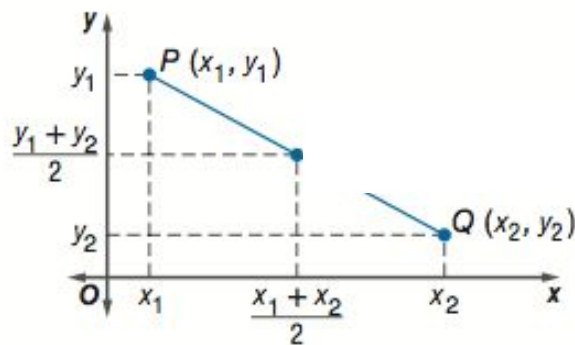


c.



**Midpoint:**

The Midpoint of a line segment is:



Geometry  
1.3 Distance and Midpoints

3. Find the coordinates of the midpoint of a segment with the given endpoints:

a.  $W(12,2), X(7,9)$

b.  $V(-2,5), Z(3,-17)$

4. Find the coordinate of the missing endpoint if  $B$  is the midpoint of  $\overline{AC}$ .

a.  $A(1,7), B(-3,1)$

b.  $C(-6,-2), B(-3,-5)$

5. Suppose  $M$  is the midpoint of  $\overline{FG}$ . Use the given information to find the missing measure or value.

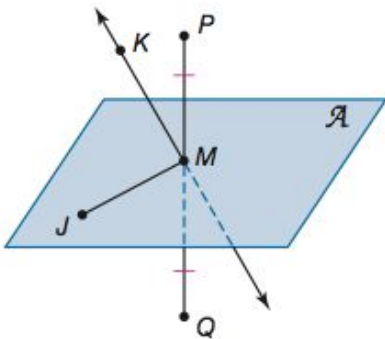
a.  $FM = 5y + 13,$

$MG = 5 - 3y, FG = ?$

b.  $FM = 8a + 1, FG = 42,$

$a = ?$

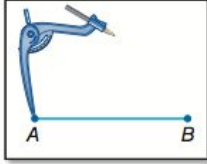
**Segment Bisector:**



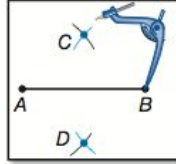
Geometry  
1.3 Distance and Midpoints

**Construction** Bisect a Segment

**Step 1** Draw a segment and name it  $\overline{AB}$ . Place the compass at point  $A$ . Adjust the compass so that its width is greater than  $\frac{1}{2}\overline{AB}$ . Draw arcs above and below  $\overline{AB}$ .



**Step 2** Using the same compass setting, place the compass at point  $B$  and draw arcs above and below  $\overline{AB}$  so that they intersect the two arcs previously drawn. Label the points of the intersection of the arcs as  $C$  and  $D$ .



**Step 3** Use a straightedge to draw  $\overline{CD}$ . Label the point where it intersects  $\overline{AB}$  as  $M$ . Point  $M$  is the midpoint of  $\overline{AB}$ , and  $\overline{CD}$  is a bisector of  $\overline{AB}$ .

