Chapter 1
Basics of Geometry

1.1 - Points, Lines and Planes

1.2 - Measuring and Constructing Segments

1.3 - Using Midpoint and Distance Formulas

1.4 - Perimeter and Area in the Coordinate Plane

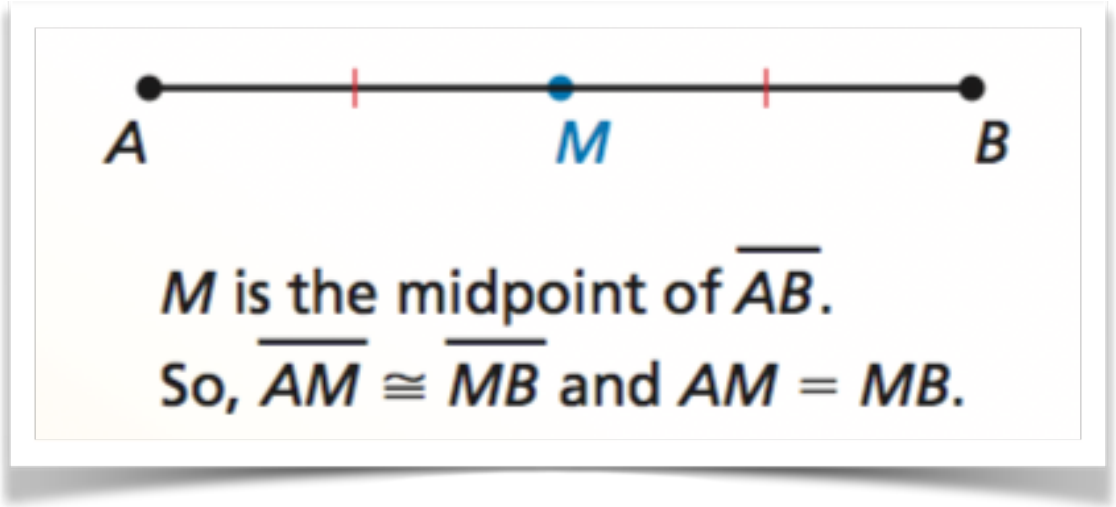
1.5 - Measuring and Constructing Angles

1.6 - Describing Pairs of Angles

1.3 - Midpoint and Distance Formulas

Vocabulary

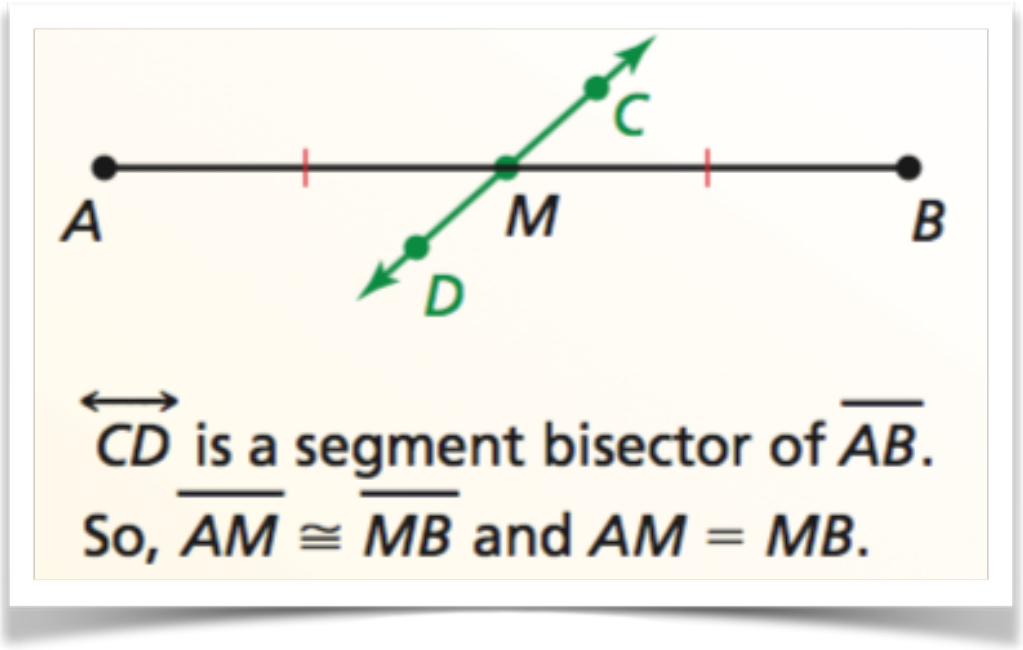
midpoint - a point on a segment that divides the segment into two congruent segments.



1.3 - Midpoint and Distance Formulas

Vocabulary

segment bisector - a point, ray, line, segment, or plane that intersects the segment at its midpoint.

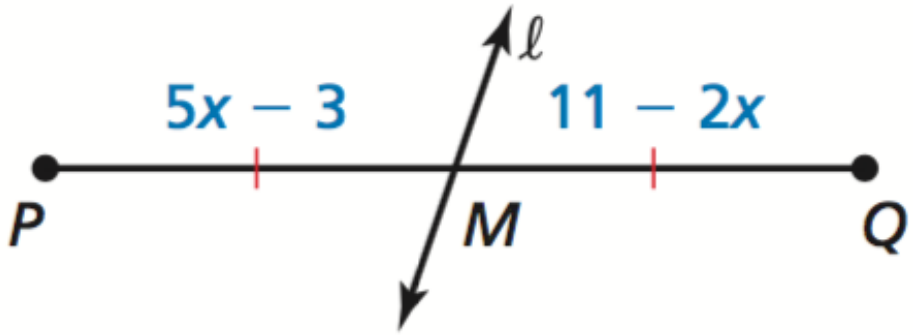


1.3 - Midpoint and Distance Formulas

Example

x =

PM =

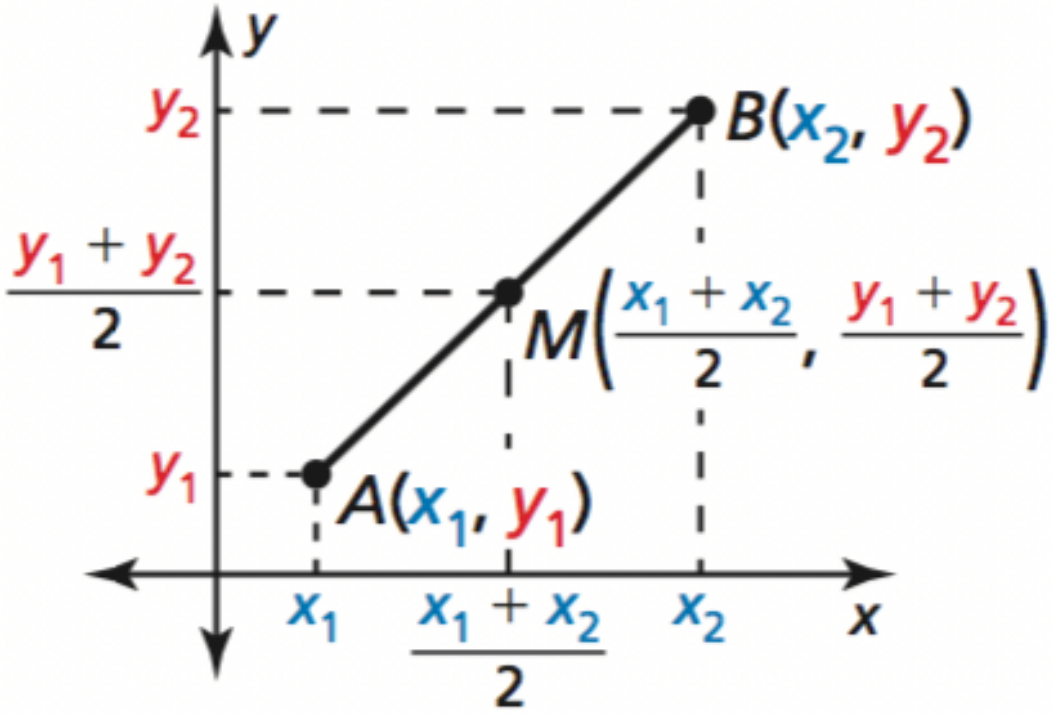


1.3 - Midpoint and Distance Formulas

Midpoint Formula

On a coordinate plane, the midpoint of a segment are the averages of the x-coordinates and the y-coordinates of the segment's endpoints.

$$M\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$$



1.3 - Midpoint and Distance Formulas

Midpoint Formula

$$M\left(\frac{x_1+x_2}{2},\frac{y_1+y_2}{2}\right)$$

Compute the following.

1) Midpoint of A(1, 2) and B(7, 8)

2) Midpoint of C(-4, 3) and D(-6, 5)

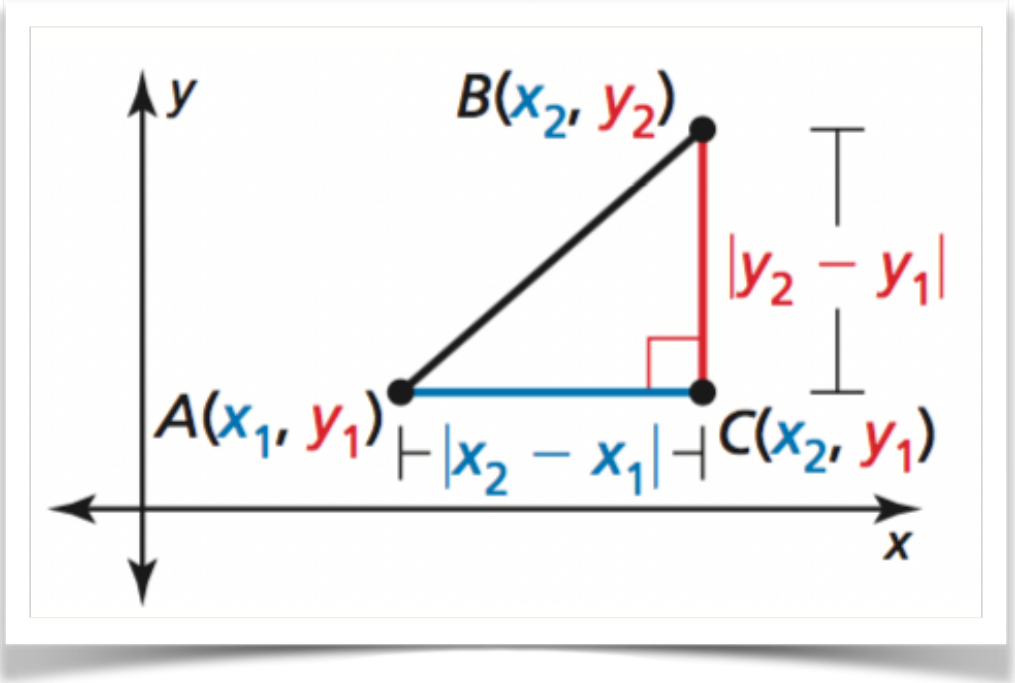
3) The midpoint of a segment VW is M(-1, -2) and one endpoint is W(4, 4). Determine the coordinate of V.

1.3 - Midpoint and Distance Formulas

Distance Formula

If $A(x_1, y_1)$ and $B(x_2, y_2)$ are points in a coordinate plane, then the distance between A and B is

$$AB = \sqrt{\left(x_2 - x_1\right)^2 + \left(y_2 - y_1\right)^2}$$



1.3 - Midpoint and Distance Formulas

Distance Formula

$$AB = \sqrt{\left(x_2 - x_1\right)^2 + \left(y_2 - y_1\right)^2}$$

Compute the distance between the following points:

$(x_1, y_1) = (2, 3)$

$(x_2, y_2) = (4, -1)$