

\$1.7 Midpoints and Bisectors

Today we will learn how to find the coordinates of a midpoint and use the definition of a segment bisector to find missing values.

Definitions:

Midpoint-

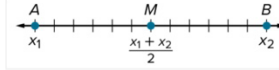
Equidistant-

bisect-

Segment bisector-

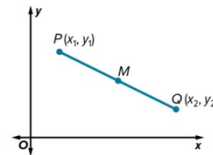
Key Concept • Midpoint on a Number Line

If \overline{AB} has endpoints at x_1 and x_2 on a number line, then the midpoint M of \overline{AB} has coordinate $M = \frac{x_1 + x_2}{2}$.

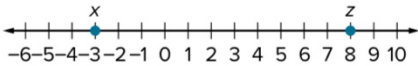


Key Concept • Midpoint Formula on the Coordinate Plane

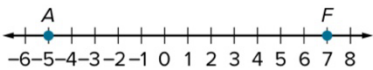
If \overline{PQ} has endpoints at $P(x_1, y_1)$ and $Q(x_2, y_2)$ on the coordinate plane, then the midpoint M of \overline{PQ} has coordinates $M \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$.



Example 1.7.1: What is the midpoint of \overline{XZ} ?



Example 1.7.2: What is the midpoint of \overline{AF} ?



Activity 1.7.3: SIGNS Aponi works at a vintage clothing store. She wants to hang a new sign so it is centered above the dressing-room doors. Given that the dressing room doors have the same width, find the point along the wall that Aponi should hang the new sign.



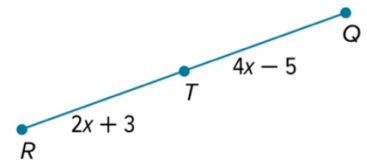
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Example 1.7.4: DISTANCE Jorge travels from his school on 38th Street to the library on 62nd Street. He stops halfway there to take a break. Where does Jorge stop to rest?



Activity 1.7.5: Find the coordinate of A if $P\left(3, \frac{1}{2}\right)$ is the midpoint of \overline{AB} and B has coordinates $(8, 3)$.

Example 1.7.6: Find the measure of \overline{RT} if T is the midpoint of \overline{RQ} .



Activity 1.7.7: Find the measure of \overline{AC} if B is the midpoint of \overline{AC} .



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