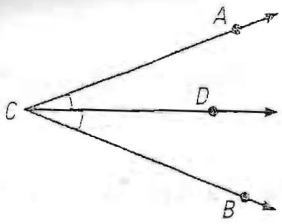
An **angle bisector** is a ray that divides an angle into two adjacent angles that are congruent. In the diagram at the right, the ray $\overrightarrow{CD}$ bisects $\angle ABC$ because it divides the angle into two congruent angles, $\angle ACD$ and $\angle BCD$.

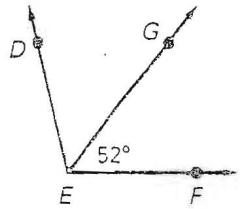
In this book, matching *congruence arcs* identify congruent angles in diagrams.



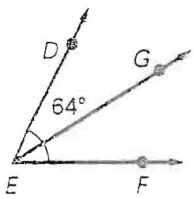
$m\angle ACD = m\angle BCD$

Checkpoint $\overrightarrow{EG}$ is the angle bisector of $\angle DEF$. Find the two angle measures not given in the diagram.

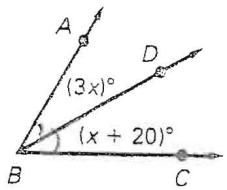
3.



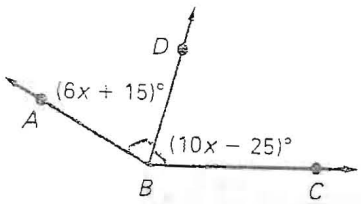
4.



5.



6.

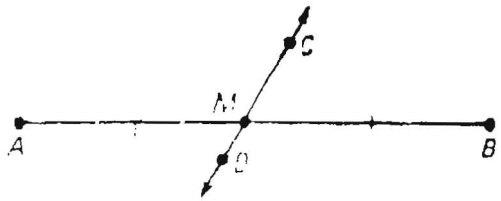


Section1.5 Segments and Angle Bisectors.

The **midpoint** of a segment is the point that divides or **bisects**, the segment into two congruent parts.

A **segment bisector** is a segment, ray, line, or plane that intersects a segment at its midpoint.

***M* is the midpoint of $\overline{AB}$ if *M* is on $\overline{AB}$ and *AM* = *MB*.**



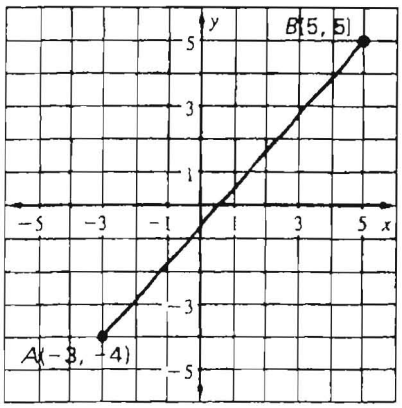
$\overleftrightarrow{CD}$ is a bisector of $\overline{AB}$.

A **construction** is a geometric drawing that uses a limited set of tools, usually a compass and straightedge(a ruler without marks.)

Midpoint Formula : If $A(x_1, y_1)$ and $B(x_2, y_2)$ are points in a coordinate plane, then the midpoint of $\overline{AB}$ has coordinates

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

Example 1 Find the coordinates of the midpoint of $\overline{AB}$ with endpoints A(-3, -4) and B(5, 5) .



Example 2. The midpoint of $\overline{JK}$ is M(1,4). One endpoint is J(-3, 2). Find the coordinates of the other endpoint