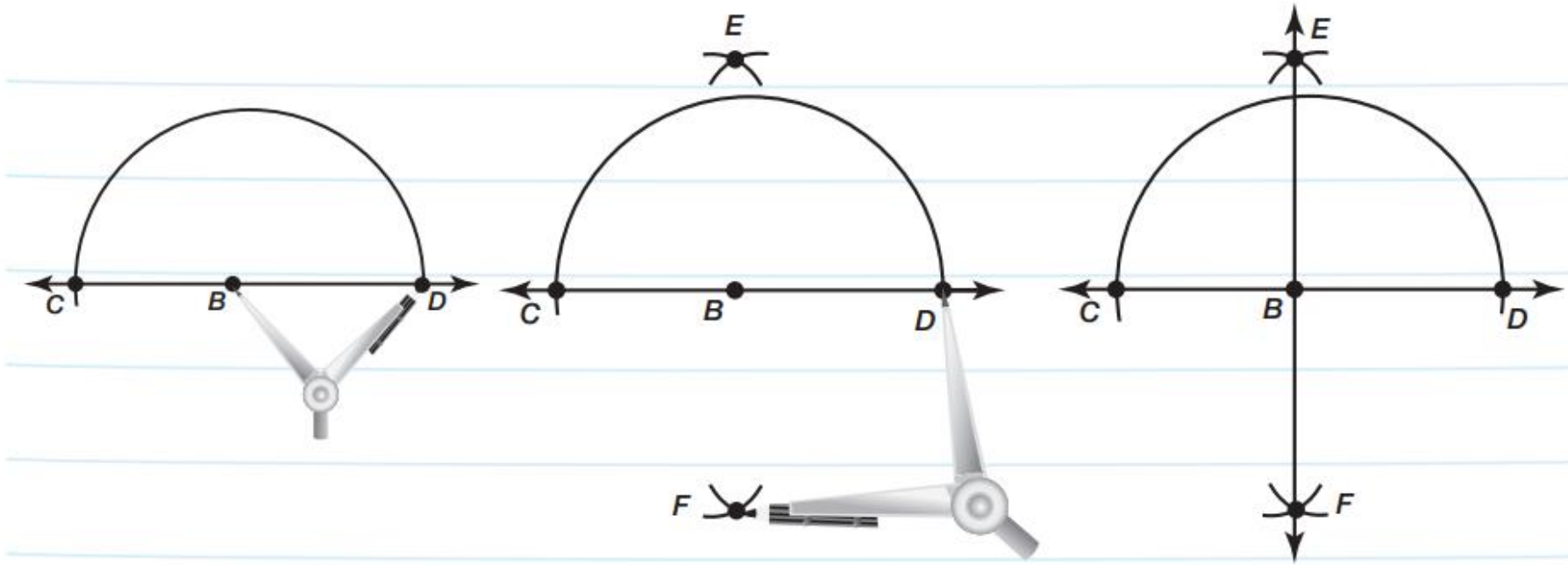
Previously, you practiced bisecting a line segment and locating the midpoint of a line segment by construction. In fact, you were also constructing a line segment perpendicular to the original line segment.

A **perpendicular bisector** is a line, line segment, or ray that bisects a line segment and is also perpendicular to the line segment.

Follow the steps to construct a perpendicular line through a point on the line.



Construct an Arc

Use *B* as the center and construct an arc. Label the intersections points *C* and *D*.

Construct Other Arcs

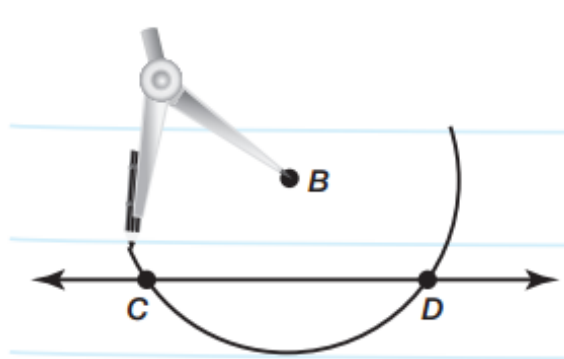
Open the compass larger than the radius. Use *C* and *D* as centers and construct arcs above and below the line. Label the intersection points *E* and *F*.

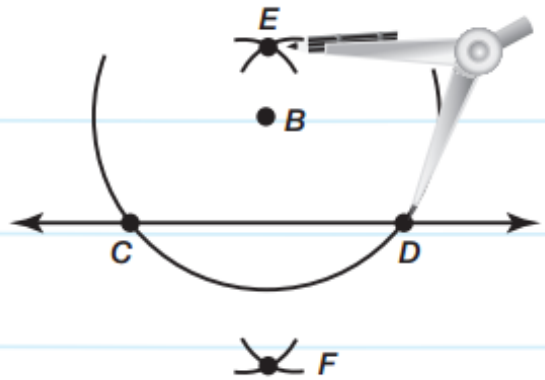
Construct a Line

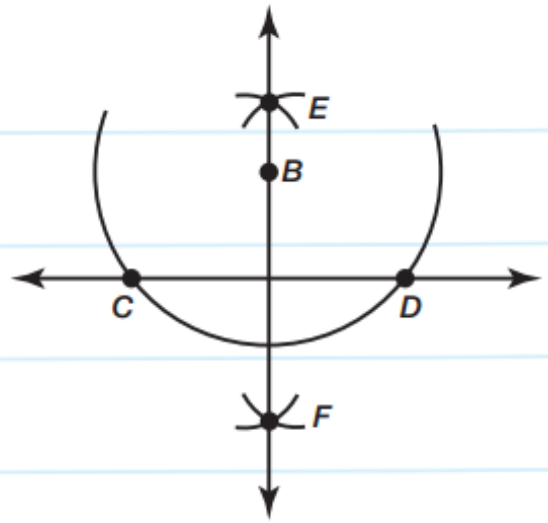
Use a straightedge to connect points *E* and *F*. Line *EF* is perpendicular to line *CD*.

1. Construct a line perpendicular to the given line through point *P*.

Follow these steps to construct a perpendicular line through a point not on a line.







Construct an Arc

Use *B* as the center and construct an arc. Label the intersection points *C* and *D*.

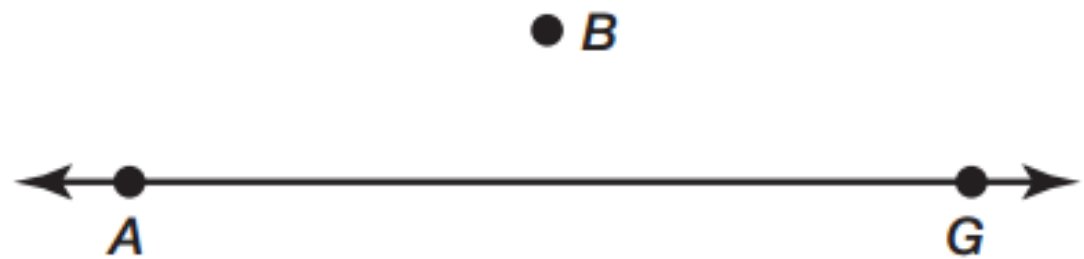
Construct Other Arcs

Open the compass larger than the radius. Use *C* and *D* as centers and construct arcs above and below the line. Label the intersection points *E* and *F*.

Construct a Line

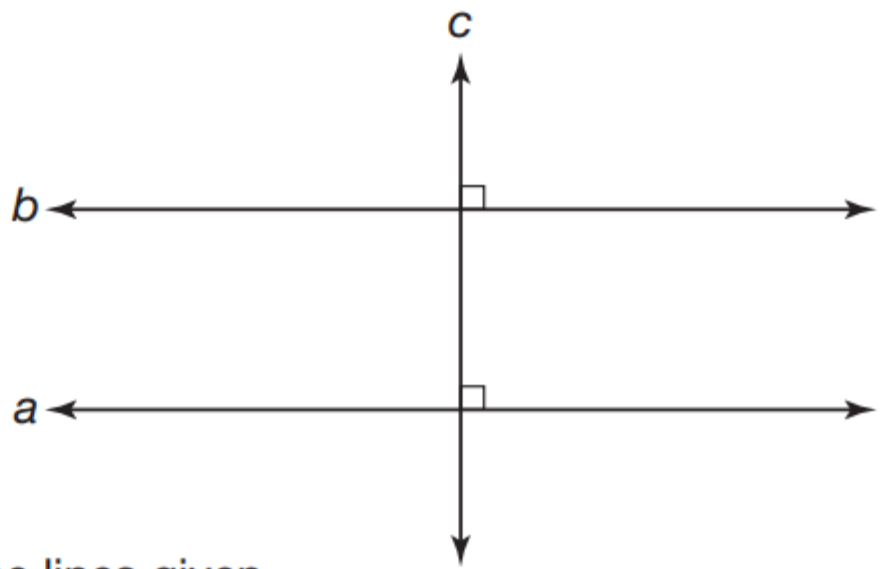
Use a straightedge to connect points *E* and *F*. Line *EF* is perpendicular to line *CD*.

5. Construct a line perpendicular to $\overleftrightarrow{AG}$ through point B.



To construct a line parallel to a given line, you must use a perpendicular line.

1. Analyze the figure shown.



Describe the relationship between the lines given.

a. *a* and *c*

b. *b* and *c*

c. *a* and *b*

2. Construct line *e* parallel to line *d*. Then, describe the steps you performed for the construction.