

Name: _____ # _____

Geometry: Period _____

Ms. Pierre

Date: _____

Constructions of Lines & Angles

Today's Objective

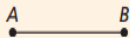
SWBAT use length and midpoint of a segment, as well as measure and construct midpoints, congruent segments, angles and angle bisectors.

A _____ is a way of creating a figure that is more precise. One way to make a geometric construction is to use a _____ and _____.



Construction Congruent Segment

Construct a segment congruent to \overline{AB} .

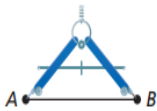


1



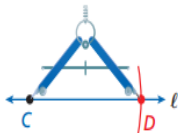
Draw ℓ . Choose a point on ℓ and label it C .

2



Open the compass to distance AB .

3

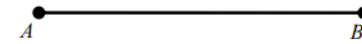


Place the point of the compass at C and make an arc through ℓ . Find the point where the arc and ℓ intersect and label it D .

$$\overline{CD} \cong \overline{AB}$$

Example 1

Construct a segment with an endpoint of C and congruent to the segment AB .



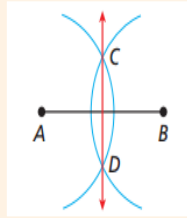
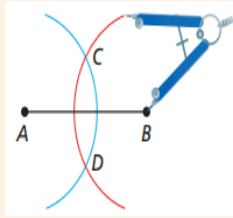
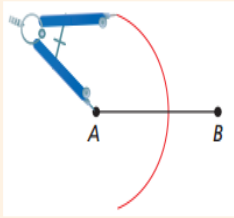
A _____ is any ray, segment, or line that intersects a segment at its midpoint. It divides the segment into two equal parts at its midpoint.

The _____ of a segment is line perpendicular to a segment at the segment's midpoint.

The shortest segment from a point to a line is _____ to the line. This fact is used to define the _____ from a point to line as the length of the perpendicular segment from the point to the line.

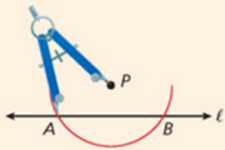


Construction Perpendicular Bisector of a Segment

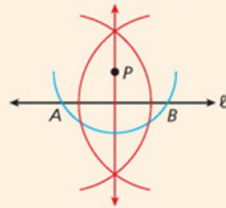


- 1 Draw \overline{AB} . Open the compass wider than half of AB and draw an arc centered at A .
- 2 Using the same compass setting, draw an arc centered at B that intersects the first arc at C and D .
- 3 Draw \overline{CD} . \overline{CD} is the perpendicular bisector of \overline{AB} .

- 1 Place the compass point on P and draw an arc that intersects ℓ at two points. Label the points A and B .



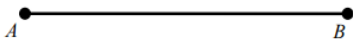
- 2 Construct the perpendicular bisector of \overline{AB} .



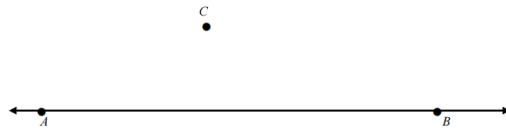
Example 2

Construct a perpendicular bisector to the line AB .

a.)



b.)

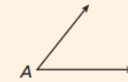


_____ are angles that have the same measure. _____ are used to show that the two angles are congruent.

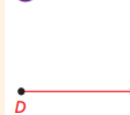


Construction Congruent Angle

Construct an angle congruent to $\angle A$.

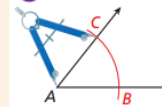


1



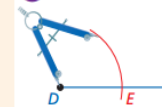
Use a straightedge to draw a ray with endpoint D .

2



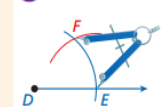
Place the compass point at A and draw an arc that intersects both sides of $\angle A$. Label the intersection points B and C .

3



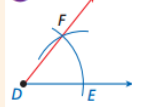
Using the same compass setting, place the compass point at D and draw an arc that intersects the ray. Label the intersection E .

4



Place the compass point at B and open it to the distance BC . Place the point of the compass at E and draw an arc. Label its intersection with the first arc F .

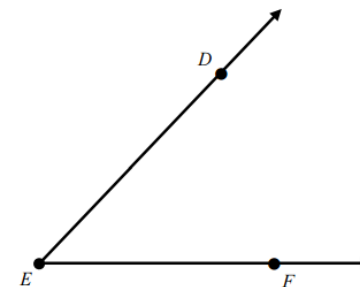
5



Use a straightedge to draw \overline{DF} .
 $\angle D \cong \angle A$

Example 3

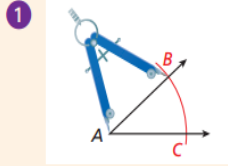
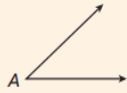
Construct a congruent angle.



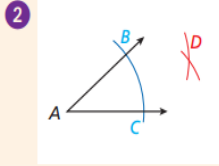


Construction Angle Bisector

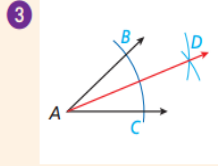
Construct the bisector of $\angle A$.



1 Place the point of the compass at A and draw an arc. Label its points of intersection with $\angle A$ as B and C .



2 Without changing the compass setting, draw intersecting arcs from B and C . Label the intersection of the arcs as D .

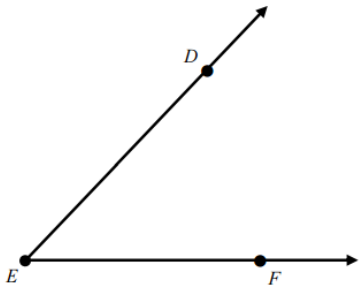


3 Use a straightedge to draw \overrightarrow{AD} .

\overrightarrow{AD} bisects $\angle A$.

Example 4

Construct an angle bisector

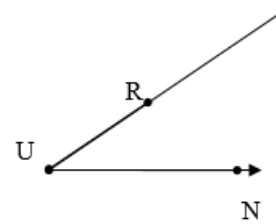


Guided Practice

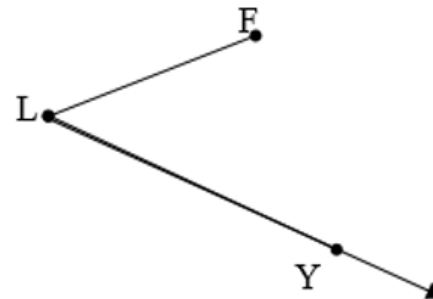
1. Copy segment \overline{AB} , and call the new one \overline{CD} .



3. Copy $\angle RUN$. Call the new one $\angle JMP$.



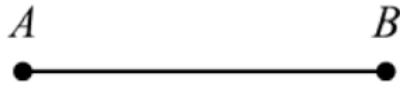
5. Bisect $\angle FLY$.





Guided Practice

7. Construct a perpendicular bisector of the line \overline{AB} .

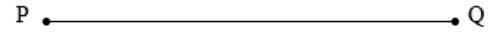


9. Construct the line perpendicular to line l through point P .

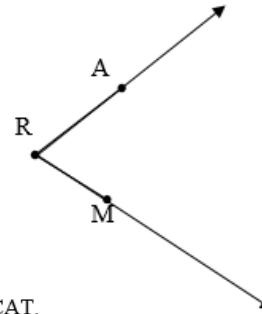


Independent Practice

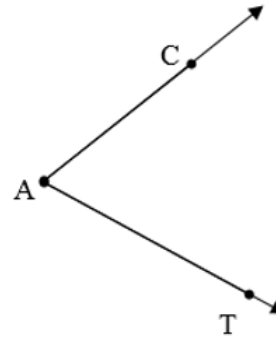
2. Copy segment \overline{PQ} , and call the new one \overline{ST} .



4. Copy $\angle ARM$. Name the new one $\angle LEG$.



6. Bisect $\angle CAT$.



10. Construct the line perpendicular to line l through point P .

