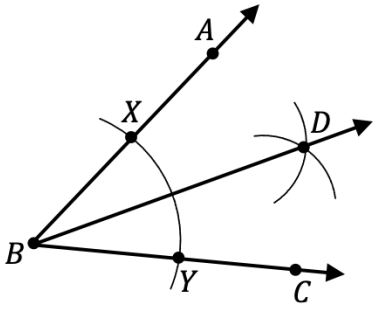
Lesson 1.10 Constructions (Copying Angles)

Students will be able to:

- Content Objective: Copy an angle using a compass.
- Language Objective: Read and understand the steps for copying an angle.

Warm Up

A straightedge and compass were used to create the construction shown below. Arc XY was drawn from point B, and arcs with equal radii were drawn from X and Y.



Which statement is false?

(1) $m\angle ABD = m\angle DBC$

(2) $\frac{1}{2}m\angle ABC = m\angle DBC$

(3) $2(m\angle ABC) = m\angle ABD$

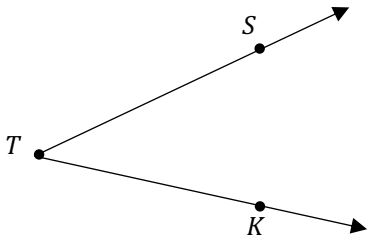
(4) $2(m\angle DBC) = m\angle ABC$

Copy an Angle

1. Draw a working line segment and label the endpoint.
2. Stretch the radius of the compass and make an arc on the angle you wish to copy such that the arc intersects the two rays that form the angle. Label these intersection points.
3. Without adjusting your compass, place the center at the endpoint of your working line segment and create an arc that intersects the segment. Label this intersection point.
4. Using your compass, measure the distance between the two intersection points of the original angle you labeled in step 2.
5. Place the center of your compass on the intersection point from step 3 and make an arc to intersect the existing arc. Label this point.
6. Draw a ray from the point on your working line segment to the point of intersection found in the previous step.

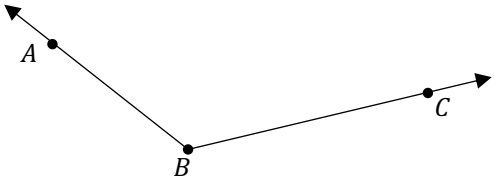
Skill 1: Copy an Angle

Use constructions to copy the angle below to form $\angle S'T'K'$ using point T' shown below. Be sure to leave all construction marks.



Exercise 1: Copy an Angle

Construct $\angle A'B'C'$ such that $\angle ABC \cong \angle A'B'C'$.

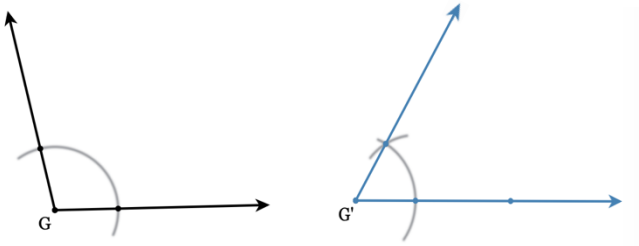


Copying an angle is an important skill that we will use later in this course to construct parallel lines.

Read it Out

Nia was asked to copy angle G using the vertex G'. When she completed her construction, she noticed that she did something incorrect because her angles do not have the same measure. She wrote out her steps below:

Step 1: Construct a ray extending from G'.
Step 2: Place compass on point G, and create an arc intersecting both rays.
Step 3: Without adjusting the compass, place compass on G' and make an arc. Mark the intersection point.
Step 4: Place compass on intersection point found in step 3 and make an arc intersecting the existing arc.
Step 5: Draw a ray extending from G' to this new intersection point.

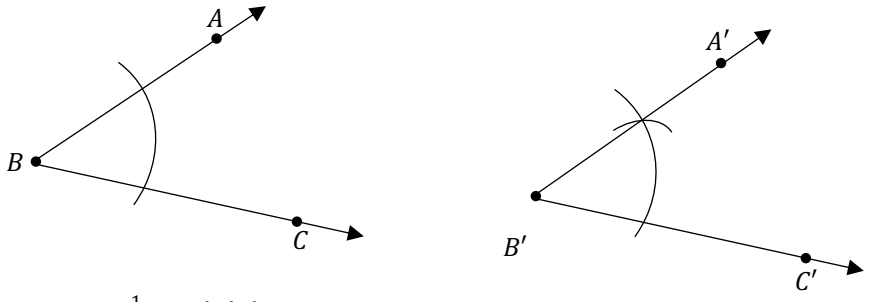


What step did Nia miss? Explain.

1.10- Problem Set

Name: _____

1. Which of the following statements is *true* based on the diagram below?



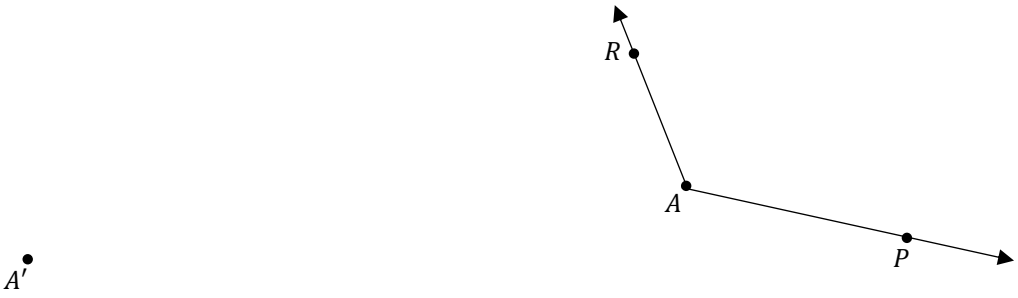
(1) $m\angle ABC = \frac{1}{2}m\angle A'B'C'$

(2) $2(m\angle A'B'C') = m\angle ABC$

(3) $m\angle A'B'C' = \frac{1}{2}m\angle ABC$

(4) $m\angle ABC = m\angle A'B'C'$

2. Given $\angle RAP$ below, use a compass and straight edge to construct $\angle R'A'P'$ such that $\angle RAP \cong \angle R'A'P'$. Point A' is given below, be sure to leave all construction marks.



3. Solve for x below based on the given illustration. Diagram is not drawn to scale.