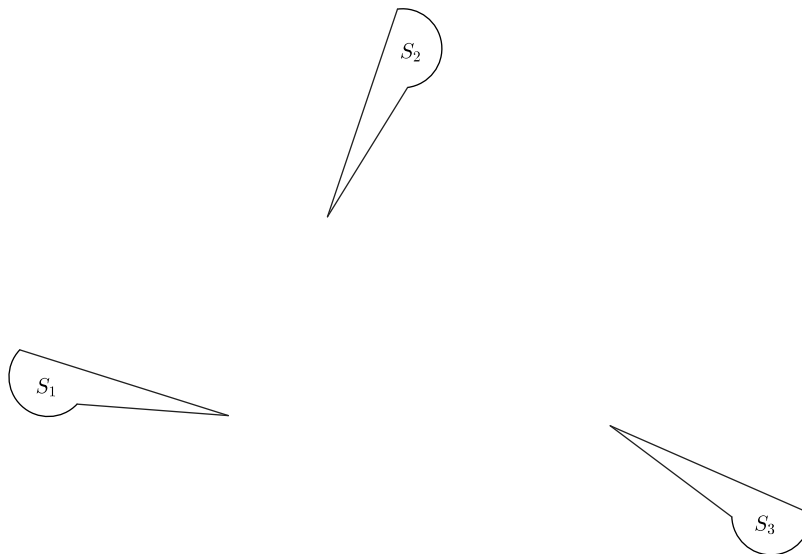# Lesson 11: Definition of Congruence and Some Basic Properties

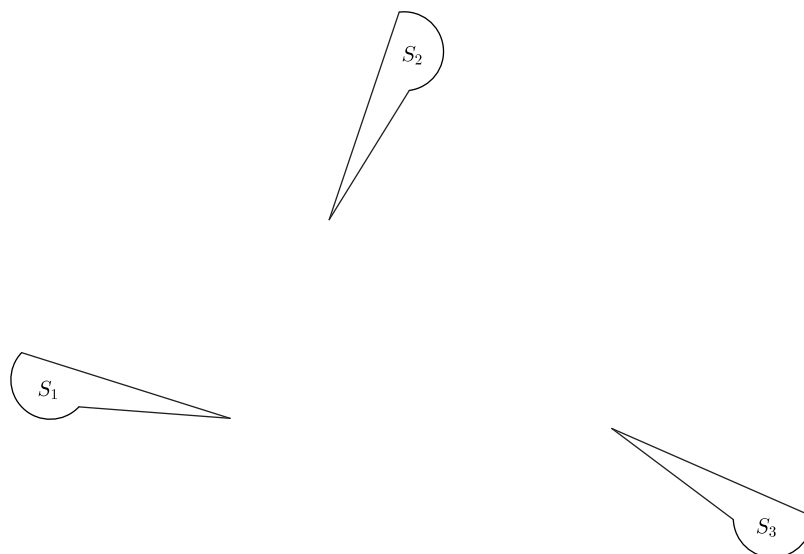## Classwork

Exercise 1

    a.   Describe the sequence of basic rigid motions that shows $S_1 \cong S_2$.
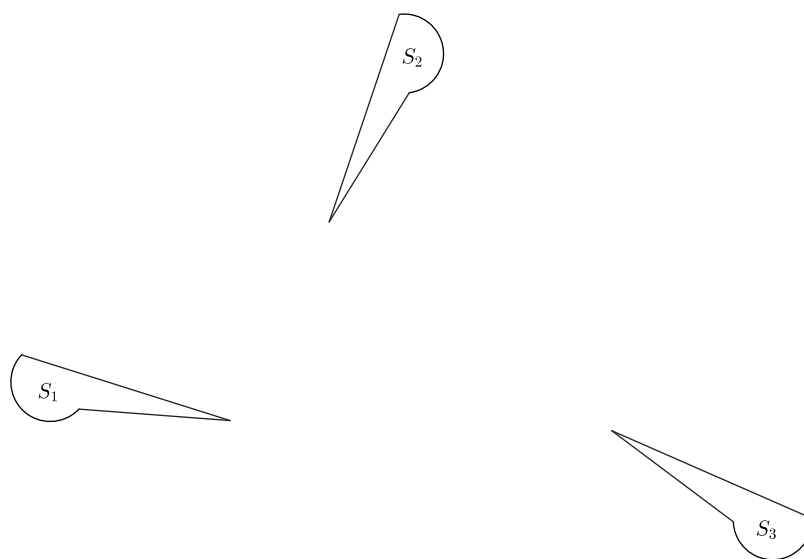
S_2

S_1

S_3

b.   Describe the sequence of basic rigid motions that shows $S_2 \cong S_3$.
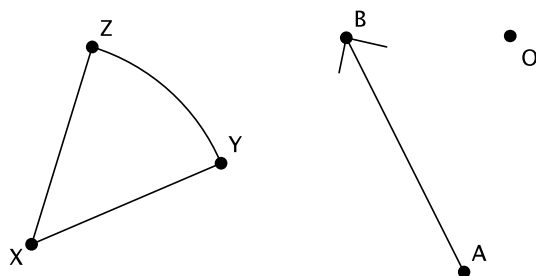
S_2

S_1

S_3

[Type here]

c.   Describe the sequence of basic rigid motions that shows $S_1 \cong S_3$.

Exercise 2

Perform the sequence of a translation followed by a rotation of Figure XYZ, where T is a translation along a vector $\overrightarrow{AB}$ and R is a rotation of d degrees (you choose d) around a center O. Label the transformed figure $X'Y'Z'$. Will $XYZ \cong X'Y'Z'$?

> **Lesson Summary**
>
> Given that sequences enjoy the same basic properties of basic rigid motions, we can state three basic properties of congruences:
>
> (C1) A congruence maps a line to a line, a ray to a ray, a segment to a segment, and an angle to an angle.
>
> (C2) A congruence preserves lengths of segments.
>
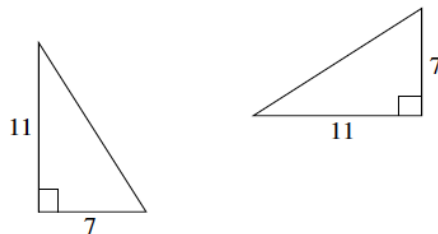> (C3) A congruence preserves degrees of angles.
>
> The notation used for congruence is ≅.

Problem Set

1. Given two right triangles with lengths shown below, is there one basic rigid motion that maps one to the other? Explain.
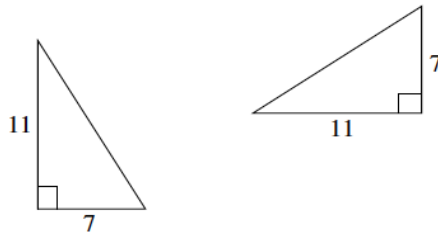
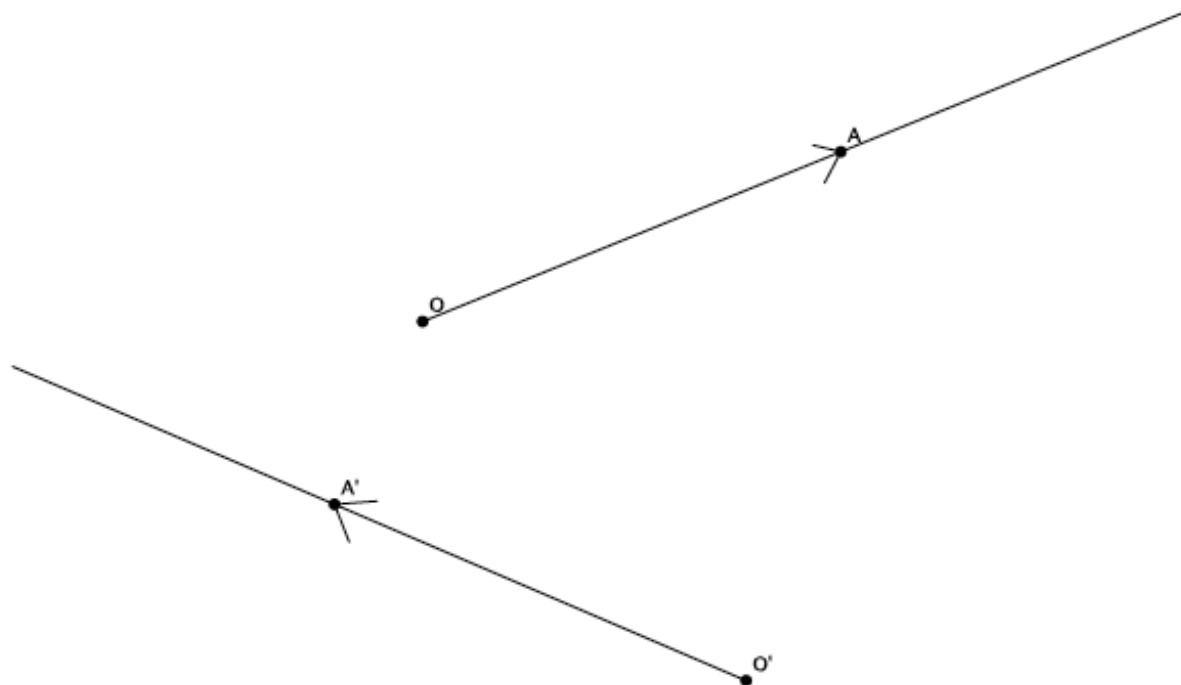2. Are the two right triangles shown below congruent? If so, describe the congruence that would map one triangle onto the other.
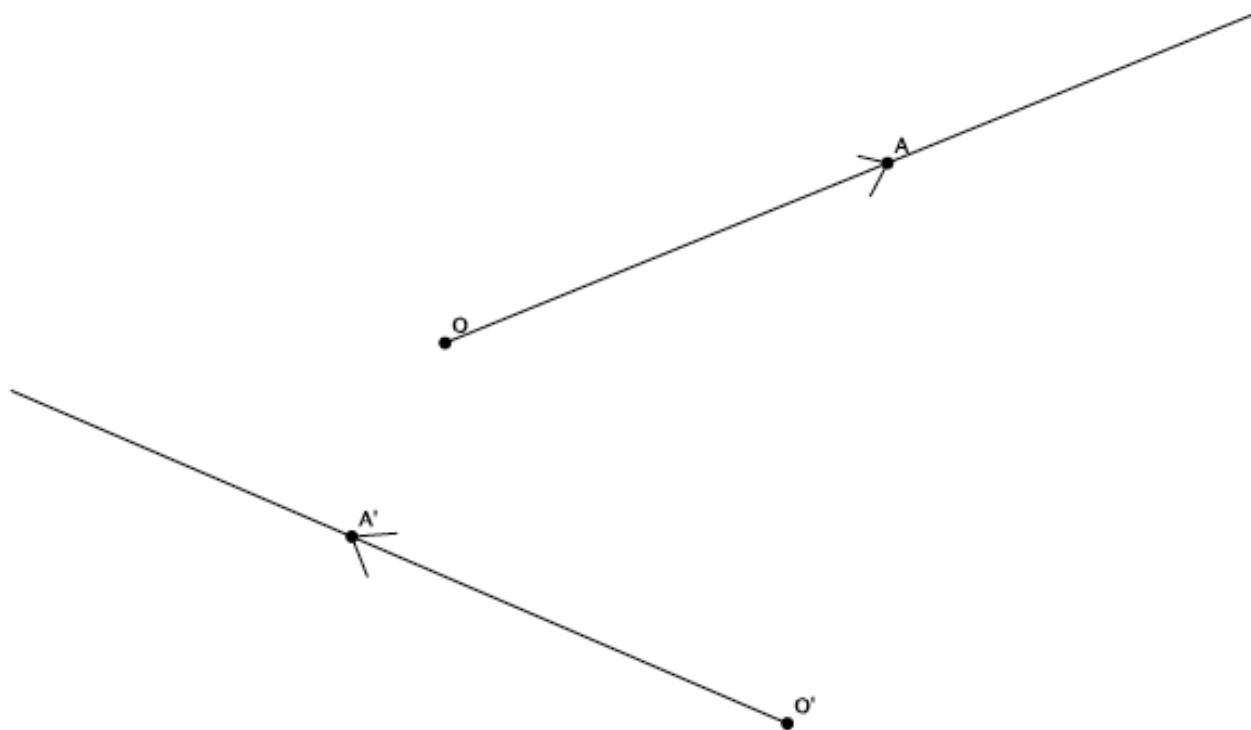

[Type here]

3.

    a.   Given two rays, $\overrightarrow{OA}$ and $\overrightarrow{O'A'}$, describe the congruence that maps $\overrightarrow{OA}$ to $\overrightarrow{O'A'}$.

    b.   Describe the congruence that maps $\overrightarrow{O'A'}$ to $\overrightarrow{OA}$.

[Type here]

[Type here]