Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_\_\_\_

**Investigating Translations**

A **transformation** is the change in the size or position of a figure. A **translation** is a transformation in which each point of a figure moves the same distance and in the same direction.

1. Translate ∆ABC to become ∆A’B’C’ using the steps below.



1. From A, count down 2 units and to the left 3 units. Label the new point A’ (A-prime).
2. Find and label points B’ and C’ by counting down 2 units and left 3 units.
3. Draw ∆A’B’C’.
4. Compare the lengths of the three line segments. What do you notice about each of these segments?

Segment AB \_\_\_\_\_\_\_ Segment A’B’ \_\_\_\_\_\_\_

Segment BC \_\_\_\_\_\_\_ Segment B’C’ \_\_\_\_\_\_\_

Segment AC \_\_\_\_\_\_\_ Segment A’C’ \_\_\_\_\_\_\_

1. What does this tell you about the effect that translations have on side lengths?
2. Using the definition of translation above, explain why ∆A’B’C’ is a translation of ∆ABC.
3. Using a protractor, measure the angles of ∆ABC and ∆A’B’C’.

m$ ∠$ A \_\_\_\_\_ m$ ∠$ A’\_\_\_\_\_\_ m$ ∠$ B \_\_\_\_\_\_ m$ ∠$ B’ \_\_\_\_\_\_ m$ ∠$ C \_\_\_\_\_\_ m$ ∠$ C’ \_\_\_\_\_\_

1. Compare $∠$A to $∠$A’, $∠$B to $∠$B’ and $∠$C to $∠$C’. What do you notice about each angle pair?
2. What does this tell you about the effect that translations have on angles?
3. When **translating** a figure, what can you summarize about each of the following?

The corresponding angles \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The corresponding side lengths\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Look at the triangle shown on the coordinate plane.
2. List the ordered pairs for the vertices of triangle ABC.

A \_\_\_\_\_\_\_\_\_\_\_

 B \_\_\_\_\_\_\_\_\_\_\_

 C \_\_\_\_\_\_\_\_\_\_\_

1. Translate triangle ABC by shifting each of the vertices -6 units vertically. Draw the new triangle and label the vertices A’, B’, and C’. List the ordered pairs for the vertices of triangle A’B’C’.

A’ \_\_\_\_\_\_\_\_\_\_\_ B’ \_\_\_\_\_\_\_\_\_\_\_ C’ \_\_\_\_\_\_\_\_\_\_\_



Pay close attention to the intervals

1. What do you notice about the ordered pairs after you translated vertically? Did both coordinates change?

By how much?

1. Translate triangle ABC -6 units horizontally instead. Draw the new triangle and label the vertices A’’, B’’, and C’’. List the ordered pairs for the vertices of triangle A’’B’’C’’.

A’’ \_\_\_\_\_\_\_\_\_\_\_ B’’ \_\_\_\_\_\_\_\_\_\_\_ C’’ \_\_\_\_\_\_\_\_\_\_\_

1. What do you notice about the ordered pairs after you translated horizontally? Did both coordinates change? By how much?
2. IF you were to translate triangle ABC 10 units vertically to form triangle DEF, what would be the ordered pairs of the corresponding vertices? (Hint: You shouldn’t NEED the graph to answer this question)

D \_\_\_\_\_\_\_\_\_\_\_ E \_\_\_\_\_\_\_\_\_\_\_ F \_\_\_\_\_\_\_\_\_\_\_

1. IF you were to translate triangle ABC 10 units horizontally to form triangle DEF, what would be the ordered pairs of the corresponding vertices? (Hint: You shouldn’t NEED the graph to answer this question)

D \_\_\_\_\_\_\_\_\_\_\_ E \_\_\_\_\_\_\_\_\_\_\_ F \_\_\_\_\_\_\_\_\_\_\_