**Activity 1.5.1 Composition – Two Reflections I**

**Directions for Intersecting Lines**

1. On a piece of graph paper, draw **intersecting lines *a* and *b***. Plot a point where the lines intersect and label it ***P***. These lines will be used as lines of reflection.
2. Draw $∆ABC$ in between the intersecting lines.
3. Place a piece of tracing paper over $∆ABC$. Use a straightedge to help you trace $∆ABC$ and line *a*.
4. Flip the tracing paper over and move it so that line a lies on top of itself.
5. Trace the image of $∆ABC$ on the tracing paper. Press firmly to make an impression on the graph paper.
6. Lift the tracing paper and draw the image of $∆ABC$ and label its vertices as $A'B'C'$.
7. Repeat steps 3-6 to reflect $∆A'B'C'$ across the line *b*and label its vertices as $A''B''C''$.
8. Find the measure of $∠APA''$ and measure the acute angle formed by lines *a* and *b*.

1. Make a conjecture about the relationship between $∠APA''$ and the acute angle formed by lines *a* and *b*.
2. Describe a single transformation that maps $∆ABC$ directly onto $∆A''B''C''$.

**Directions for Parallel Lines**

1. On a piece of graph paper, draw two **vertical** **parallel lines.** Name the line farthest to theleft** line *c*** and the onefarthest to the right **line *d***.
2. Draw $∆DEF$ to the left of the first line.
3. Place a piece of tracing paper over $∆DEF$. Use a straightedge to help you trace $∆DEF$ and line *c*.
4. Flip the tracing paper over and move it so that the line lies on top of itself.
5. Trace the image of $∆DEF$ on the tracing paper. Press firmly to make an impression on the graph paper.
6. Lift the tracing paper and draw the image of $∆DEF$ and label its vertices as $D'E'F'$.
7. Reflect $∆D'E'F'$ across the line *d*and label its vertices as $D''E''F''$.
8. Measure the distance between lines *c* and *d*, and the lengths of $DD^{''}, EE^{''}and FF^{''}. .$
9. Make a conjecture about the relationship between the distance between lines *c* and *d*, and the lengths of $DD^{''}, EE^{''}and FF^{''}. .$
10. What do you notice about $\overbar{DD^{''}}, \overbar{EE^{''}}$and $\overbar{FF^{''}}$?
11. Describe a single the transformation that maps $∆DEF$ to $∆D''E''F''$.
12. How is the distance between lines c and d related to the transformation that maps $∆DEF$ to $∆D''E''F''$?