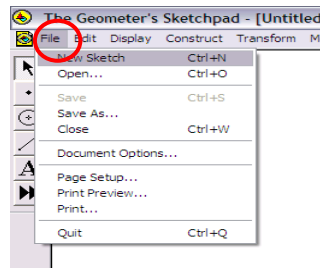
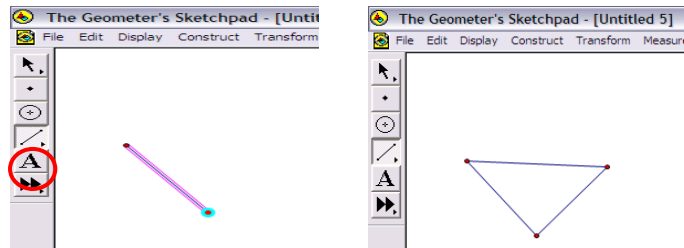


Exploring Translations

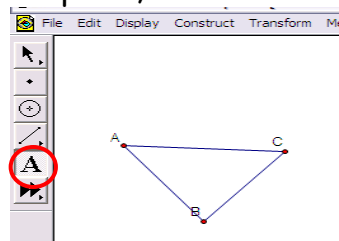
1. New Sketch: To open a new sketch go to **FILE** and click on **New Sketch**



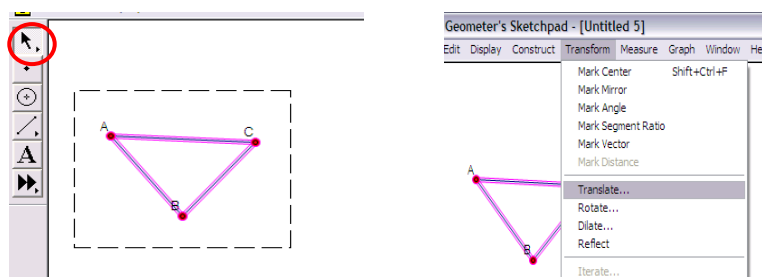
2. Create a triangle.
 - a. Using the **SEGMENT** tool, construct a triangle.
 - b. Drag the cursor and release for each segment.



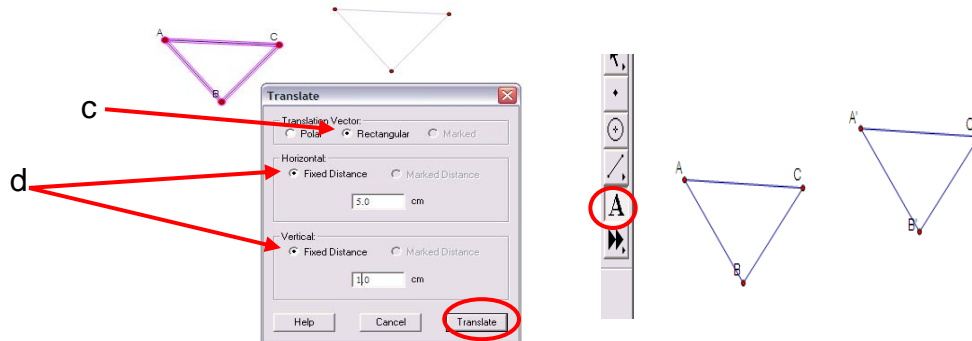
3. Label the triangle ABC.
 - a. Click on the **LABEL** tool and put the cursor over each point. When you see a black hand hovering over point, click.



4. Create a transformation.
 - a. Click on the **ARROW** tool. Using the cursor, drag a marquee (box) around the triangle to select it. The segments in the triangle will turn pink.
 - b. Go to the **TRANSFORM** menu. Choose **TRANSLATE**

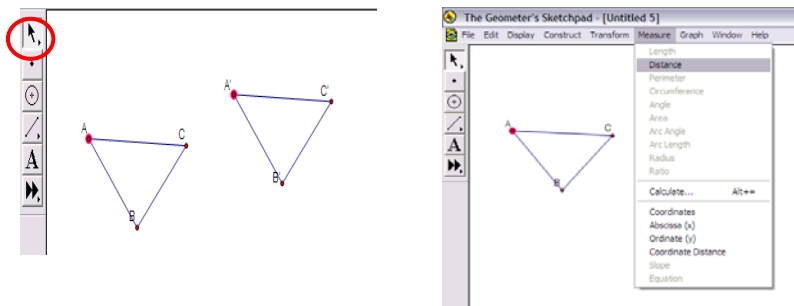


- Choose **RECTANGULAR** Translation Vector.
- Enter a number between 1 and 10 into the horizontal and vertical distance boxes.
- Click on **TRANSLATE**.
- Click on the **LABEL** tool and label the new triangle (A' , B' , C')



5. Measure Distance

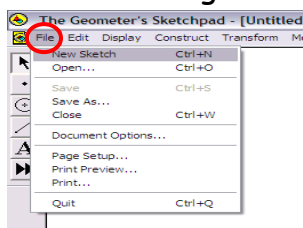
- Use the **ARROW** tool to select one pair of corresponding points (A , A').
- Go to the **MEASURE** menu and choose **DISTANCE**.
- Repeat steps a and b to the other two pairs of corresponding points (B , B' and C , C'). What do you notice?



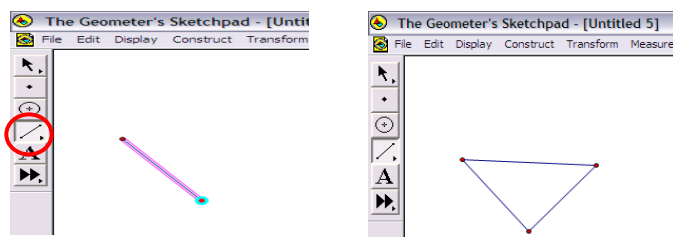
- Use the **ARROW** tool to drag a vertex of your original triangle. What do you notice?
- Changing the horizontal and vertical values.
 - Go to **EDIT** menu and continue to choose **UNDO** until only your original **pink** triangle is left.
 - Go to **TRANSFORM** menu and choose **TRANSLATE**. Change the horizontal and vertical values to negative numbers. What happened?
 - MEASURE** distances between the new corresponding points. What do you notice?

Exploring Rotations

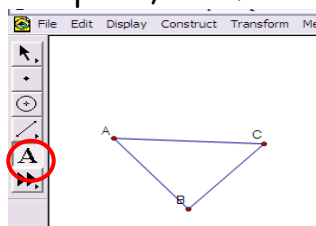
1. New Sketch: To open a new sketch go to **FILE** and click on **New Sketch**



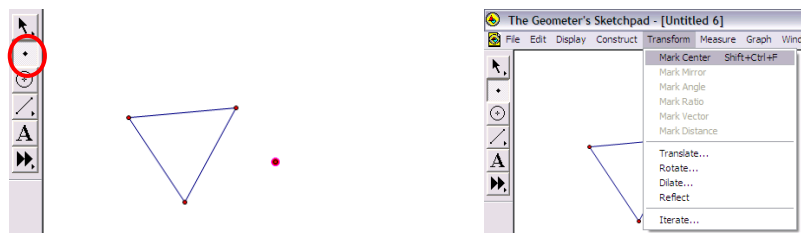
2. Create a triangle.
 - a. Using the **SEGMENT** tool, construct a triangle.
 - b. Drag the cursor and release for each segment.



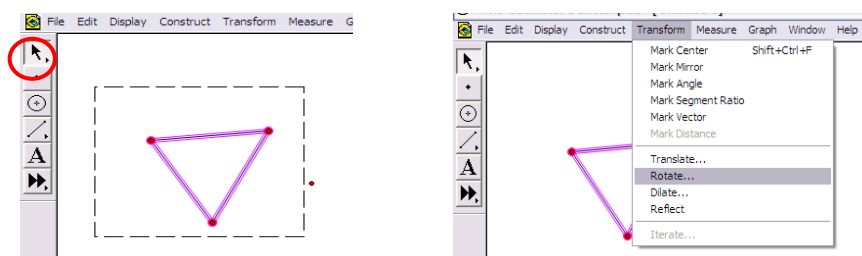
3. Label the triangle ABC.
 - b. Click on the **LABEL** tool and put the cursor over each point. When you see a black hand hovering over point, click.



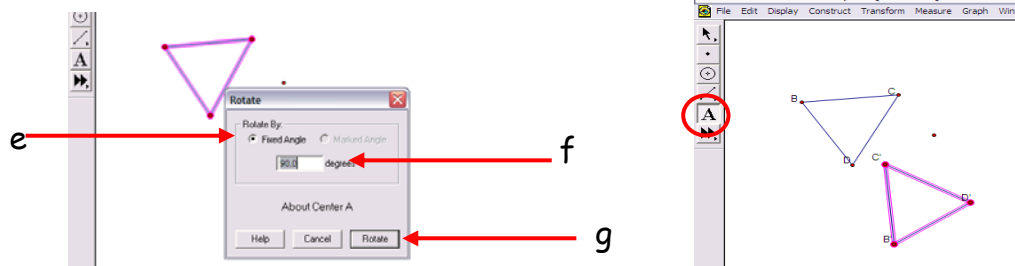
4. Create a rotation.
 - a. Using the **POINT** tool, construct a point outside your triangle.
 - b. While the new point is still selected (pink), go to the **TRANSFORM** menu and choose **MARK CENTER**.



- c. Using the **ARROW** tool, drag a marquee (box) around your triangle to select it. The triangle will turn pink.
- d. Go to the **TRANSFORM** menu and choose **ROTATE**.

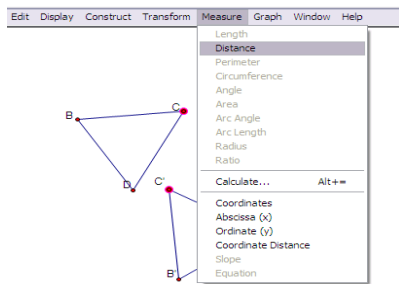


- e. Choose **FIXED**
- f. Enter an angle measure between 45° and 120° .
- g. Click on **ROTATE**
- h. Click on the **LABEL** tool and label the new triangle (A' , B' , C')



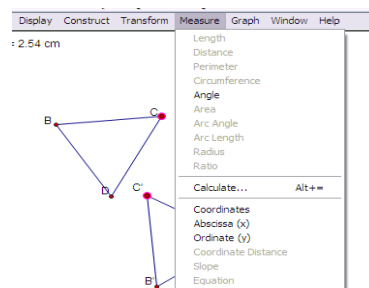
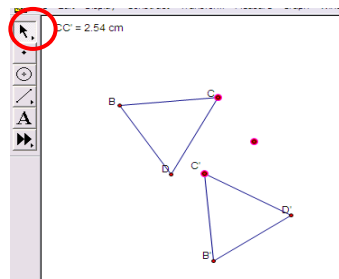
5. Measure Distance

- a. Use the **ARROW** tool to select one pair of corresponding points (A , A').
- b. Go to the **MEASURE** menu and choose **DISTANCE**.
- c. Repeat steps a and b to the other two pairs of corresponding points (B , B' and C , C'). What do you notice?



6. Measure the angle formed by corresponding points and center of rotation

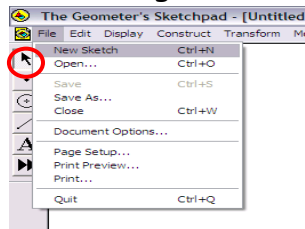
- a. Select the points with the **ARROW** tool (C , center, C'). They will turn **pink**.
- b. Go to the **MEASURE** menu and choose **ANGLE**
- c. Repeat steps a and b to measure the other 2 angles. What do you notice?



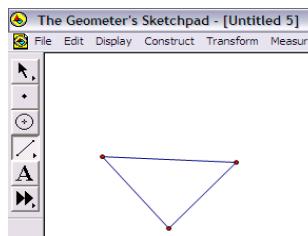
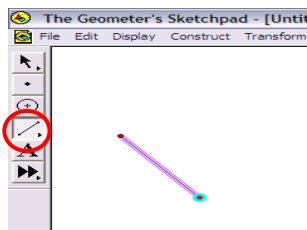
7. Use the **ARROW** tool to drag a vertex of your original figure. What do you notice?

Exploring Reflections

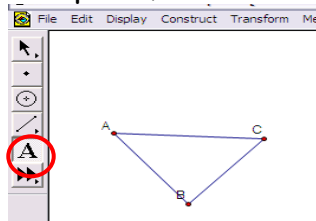
1. New Sketch: To open a new sketch go to **FILE** and click on **New Sketch**



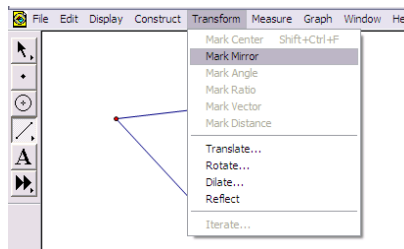
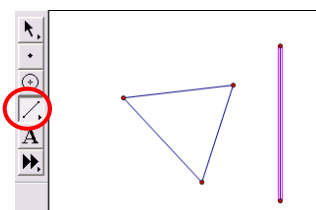
2. Create a triangle.
 - a. Using the **SEGMENT** tool, construct a triangle.
 - b. Drag the cursor and release for each segment.



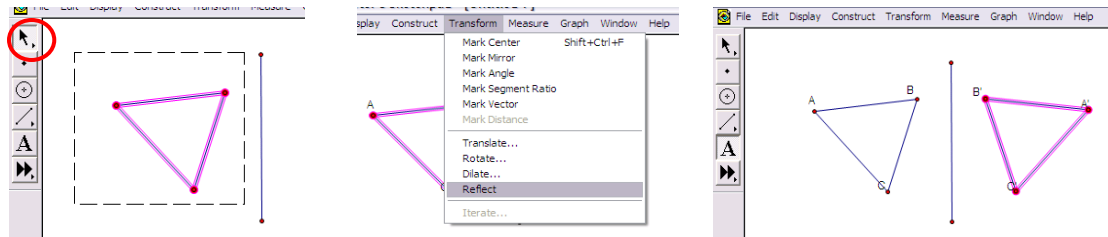
3. Label the triangle ABC.
 - a. Click on the **LABEL** tool and put the cursor over each point. When you see a black hand hovering over point, click.



4. Create a reflection
 - a. Using the **SEGMENT** tool, construct a line segment to the right of your triangle. Keep the line **pink**.
 - b. Go to the **TRANSFORM** menu and choose **MARK MIRROR**. This is the mirror line.

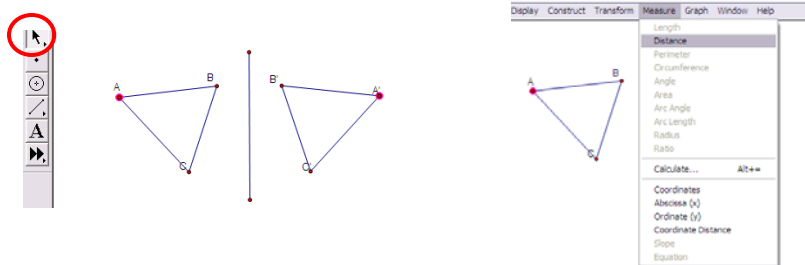


- Using the **ARROW** tool, drag a marquee (box) around your triangle to select it. The triangle will turn **pink**.
- Go to the **TRANSFORM** menu and choose **REFLECT**.
- Using the **LABEL** tool, label the corresponding points.



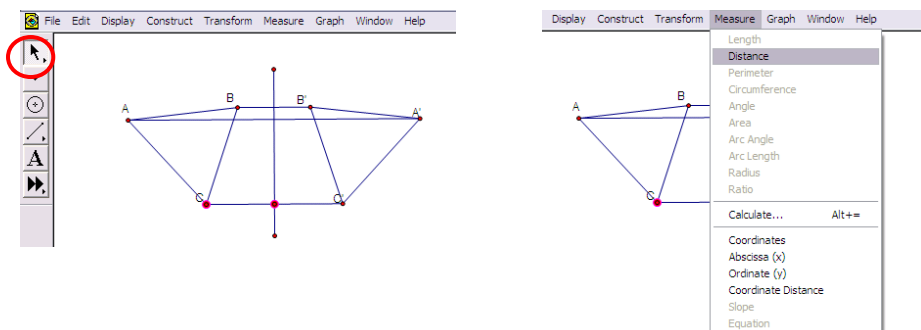
5. Measure Distance

- Use the **ARROW** tool to select one pair of corresponding points (A, A').
- Go to the **MEASURE** menu and choose **DISTANCE**.
- Repeat steps a and b to the other two pairs of corresponding points (B, B') and (C, C'). What do you notice?



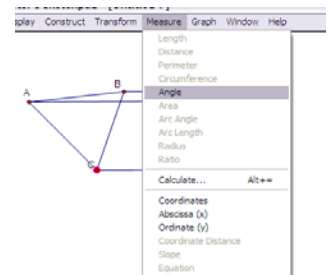
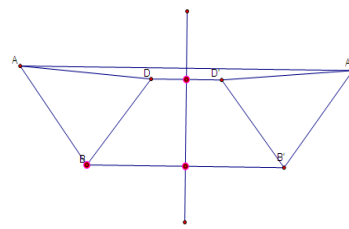
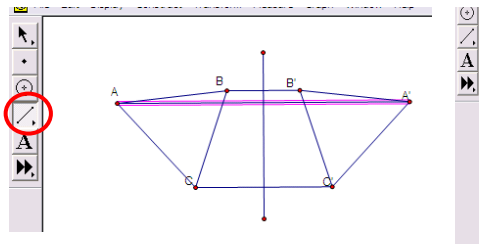
6. Measure distance from the point of intersection

- Pick point C and the intersection point of CC' with the mirror line. They will turn **pink**.
- Go to the **MEASURE** menu and choose **DISTANCE**.
- Repeat steps a and b to measure the distance of the corresponding point (C') from the point of intersection on the mirror line. What do you notice about the measurements?
- Measure the distance of the rest of the points to the point of intersection with the mirror line (A, A', B , and B'). How do the distance measurements compare to your measurements in question 5?



7. Measure an Angle from the point of intersection

- Using the **SEGMENT** tool, construct a line segment between each pair of corresponding points (A, A') (B, B') and (C, C').
- Pick point C , the intersection point of $\overline{CC'}$ and a second point of intersection on the mirror line (see second diagram). They will turn **pink**.
- Go to the **MEASURE** menu and choose **ANGLE**
- Repeat the above steps to measure the angles formed by $\overline{AA'}$ and $\overline{BB'}$. What do you notice?



8. Drag any point on the original triangle. What happens to the measurements?

9. Drag the mirror line. What happens to the measurements?