

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Congruence: Geometrical Constructions

Constructing Geometric figures is one of the more fun aspects of Geometry. So, get your paper and a straight-edge - we're going to make some shapes.

Materials needed:

1 piece of  $8\frac{1}{2}$  x 11" copy paper (lined notebook paper will do)

1 pair of scissors

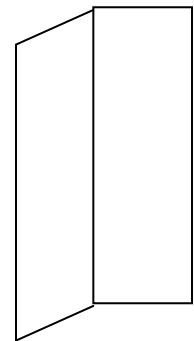
1 pencil or pen

Straight edge/ruler

Compass

This worksheet is all about following directions.

**1. Create four similar quadrilaterals.** Fold your piece of paper in half vertically so that the corners match up. When you unfold, your paper should have a vertical crease:



Cut along the crease so that you have two strips of equal length.

Fold these in half length-wise and then cut along the crease.

Describe how we know that these are similar polygons:

**2. Bisect a segment.** On one of your four quadrilaterals, draw a straight line that is parallel to the length of the paper. Label the line segment AB.

Fold the paper in half and draw a line along the crease. (1) Write about what you have made:

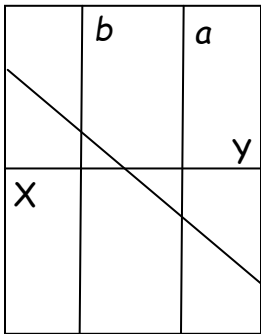
**3. Construct a perpendicular bisector.** Measure the angle created by the bisector and AB. Write the measurement here: \_\_\_\_\_ (2). We know that a line is perpendicular to another line if the angle measure created is  $90^\circ$ .

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**4. Parallel lines.** Take another piece of paper and fold it in thirds so that the edge of one side of the paper touches the crease of the other side of the paper. Unfold the paper and then draw a straight line along the crease. How do you know that these lines are parallel? \_\_\_\_\_(3) Label these lines  $a$  and  $b$ .

Now, fold along the width of the paper so that the crease crosses over both parallel lines. Draw a line along the crease. What is created? \_\_\_\_\_(4)



**5. Congruence.** Using the same piece of paper, fold the paper in half across the parallel lines. Draw a line along this new crease. Label this new line  $XY$ . Your image should be similar to the figure.

Label the congruent angles.

$XY$  is what kind of bisector to  $a$  and  $b$ ? \_\_\_\_\_(5)

**6. Triangles.** Fold your third piece of paper in half length-wise. Open and then fold the top corners like you are making a paper airplane, so that the top edges touch the central vertical crease. Cut along the line created by the fold and trim the flaps. You should end up with an isosceles triangle.

Trace the triangle onto one half of the remaining folded paper. Then, fold the paper over itself and trace the image of the triangle. Unfold the paper and retrace the image. How is this image different from the original? \_\_\_\_\_(6)

Is it similar? \_\_\_\_\_(7)

What other transformations are possible? \_\_\_\_\_(8)

\_\_\_\_\_ (9)

\_\_\_\_\_ (10)

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## Answer Key

### Congruence: Geometric Construction

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1. four quadrilaterals, or four rectangles
2. 90 degrees
3. measure them - they should all have the same measurement
4. perpendicular bisector
5. perpendicular
6. it is reflected
7. Yes
- 8-10. slide transformation, dilation, stretch, rotation