

# 10A Meet in the "Middle"

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

SHOW YOUR WORK AND WORK IN PENCIL

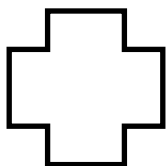
**OBJECTIVE:** Find lines and symmetry and construct perpendicular bisectors Due Date: March 12<sup>th</sup> / March 13<sup>th</sup>



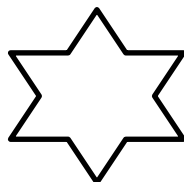
1. Draw **all** possible **lines of symmetry** for the following letters (if none, state so).

# I LOVE MATH!

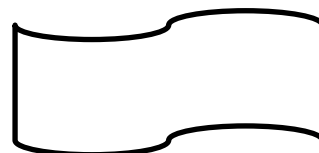
2. Draw all possible **lines of symmetry** for the following. The **angle of rotation** is the number of degrees to rotate a figure onto itself. List the angle of rotation for the figures below.



Angle of Rotation: \_\_\_\_\_

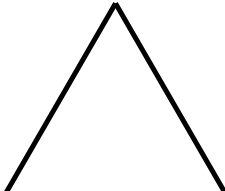
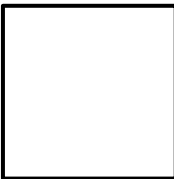
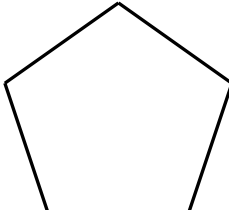
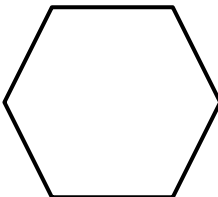


Angle of Rotation: \_\_\_\_\_



Angle of Rotation: \_\_\_\_\_

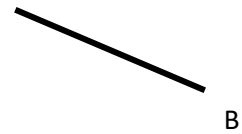
3. **For each of the regular (equal sides) polygons below** (1) name the polygon, (2) draw all lines of symmetry, (3) draw the diagonals-in a different color (**Diagonals joint two non-consecutive vertices**) and (4) State the angle of rotation between 0-359° (what degrees for the image to rotate onto itself)

 <p>Name: _____ # of Lines of Symmetry: _____ # of Diagonals: _____ Angle of Rotation: _____</p>	 <p>Name: _____ # of Lines of Symmetry: _____ # of Diagonals: _____ Angle of Rotation: _____</p>
 <p>Name: _____ # of Lines of Symmetry: _____ # of Diagonals: _____ Angle of Rotation: _____</p>	 <p>Name: _____ # of Lines of Symmetry: _____ # of Diagonals: _____ Angle of Rotation: _____</p>

4. Finding equations (**Parallel or Perpendicular**) to the given information through the given point.

	PARALLEL	PERPENDICULAR						
<p>a. Table of the line:</p> <table border="1" data-bbox="110 1591 344 1696"> <tbody> <tr> <td><math>x</math></td> <td><math>y</math></td> </tr> <tr> <td>3</td> <td>-8</td> </tr> <tr> <td>12</td> <td>-26</td> </tr> </tbody> </table>	$x$	$y$	3	-8	12	-26	<p>Parallel line through the point (3, 8)</p>	<p>Perpendicular line through the point (4, 8)</p>
$x$	$y$							
3	-8							
12	-26							
<p>b. Equation: <math>4y + 8 = 16x</math></p>	<p>Parallel line through the point (-1, -7)</p>	<p>Perpendicular line through the point (-2, 10)</p>						

5. Define **bisector** \_\_\_\_\_
6. **CONSTRUCT** a perpendicular bisector for each of the lines below.



7. From above, label the intersection of the given line and the line you constructed as point C. How does  $\overline{AC}$  compare to  $\overline{BC}$ ? \_\_\_\_\_

8. Use the grid to the right with points A, B, C and D.

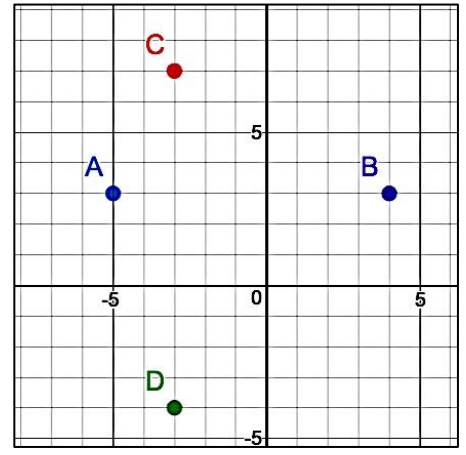
a. List the coordinates for the following points:

A (\_\_\_\_, \_\_\_\_) B (\_\_\_\_, \_\_\_\_) C (\_\_\_\_, \_\_\_\_) D (\_\_\_\_, \_\_\_\_)

b. Find the midpoints of the segments below:

$\overline{AB}$  (\_\_\_\_, \_\_\_\_)  $\overline{CD}$  (\_\_\_\_, \_\_\_\_)  $\overline{AC}$  (\_\_\_\_, \_\_\_\_)  $\overline{BD}$  (\_\_\_\_, \_\_\_\_)

c. Using the points above, explain how to find the **midpoint**.



9. Plot and connect the points  $(-4, 6)$  and  $(2, -6)$  to make a line segment.

a. Find the **equation** of the segment. \_\_\_\_\_

b. Find the **midpoint** of that segment **algebraically**. \_\_\_\_\_

c. **CONSTRUCT** the **perpendicular bisector** of the segment.

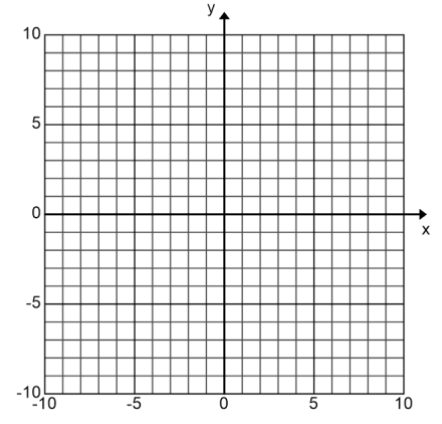
d. Find the **equation** of the **perpendicular bisector**: \_\_\_\_\_

e. Using the equation, explain how you know the lines are **perpendicular**.

\_\_\_\_\_

f. Explain how you know it is a **bisector**. \_\_\_\_\_

\_\_\_\_\_



10. Plot the segment with endpoints **P(-1, -2) & D(3, 6)**.

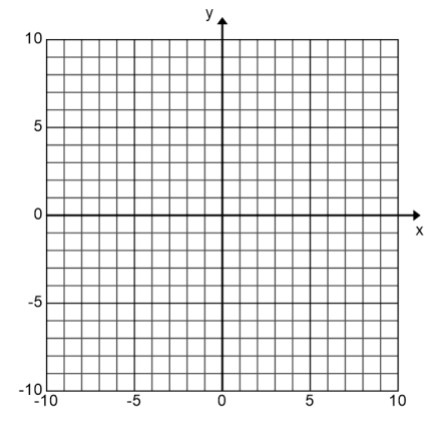
a. Find the midpoint of  $\overline{PD}$  (\_\_\_\_\_, \_\_\_\_\_).

b. Slope of  $\overline{PD}$ ? \_\_\_\_\_. Slope of a line perpendicular to  $\overline{PD}$ ? \_\_\_\_\_

c. Find the equation of its **perpendicular bisector**.

d. **CONSTRUCT** the perpendicular bisector to check your equation.

e. What evidence would convince Judge Judy that the line is a perpendicular bisector of the given segment?



**Use the image for the following questions.** The two horizontal lines have the same slope.

11.  $\angle H$  and  $\angle D$  are \_\_\_\_\_.  $\angle A$  and  $\angle B$  are \_\_\_\_\_.

12. If  $m\angle A = (50 + 3x)^\circ$  and  $m\angle B = [10(x - 2)]^\circ$ , find x.

