**STATION 1: Parallel and Perpendicular Lines**

Writing equations of lines that are parallel and perpendicular

1. Given an equation , write an equation perpendicular to this equation going through the point (6, 7)
2. Given an equation , write an equation parallel to this equation going through the point (8, 11)

**STATION 2: Midpoint and Distance Formula**

1. Plot and label these points: J (-6, 2) K (4, 2) L (-1, 7) M (-1, 2)
2. Form line segments JK, JL and KL by connecting points J, K, and L
3. Use the **distance formula** to find the lengths of the following line segments:

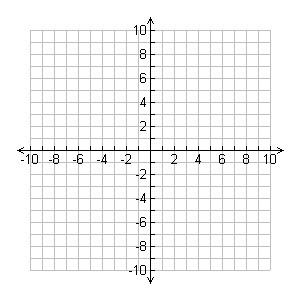
JK \_\_\_\_\_\_\_\_\_\_ JL \_\_\_\_\_\_\_\_\_\_ KL \_\_\_\_\_\_\_\_\_\_

JM \_\_\_\_\_\_\_\_\_\_ MK \_\_\_\_\_\_\_\_\_\_

1. Calculate **the midpoint** of line segment JK
   1. Midpoint of segment JK = \_\_\_\_\_\_\_\_\_\_\_

***Conclusion Questions:***

* Do you notice anything interesting about the lengths of segments JL and KL?



* What is special about the point M?

**STATION 3: Rotation, Translation and Reflection**

Quadrilateral *ABCD* is plotted on the grid below.

1. Translate the quadrilateral *ABCD*, ( x + 1, y – 7) and label it *A’B’C’D’*
2. Write the new coordinates of *A’B’C’D’* below

*A’:\_\_\_\_\_ B’:\_\_\_\_\_\_*

*C’:\_\_\_\_\_\_ D’:\_\_\_\_\_\_*

1. Reflect quadrilateral *A’B’C’D’* **over the y-axis** and label it *A”B”C”D”*
2. Write the new coordinates of *A”B”C”D”* below

*A’’:\_\_\_\_ B’’:\_\_\_\_\_ C’’:\_\_\_\_ D’’:\_\_\_\_*

1. Rotate the quadrilateral *ABCD* **270⁰ clockwise** and label it *A’’’B’’’C’’’D’’’*
2. Write the new coordinates of *A’’’B’’’C’’’D’’’* below

*A’’’:\_\_\_\_\_ B’’’:\_\_\_\_\_\_ C’’’:\_\_\_\_\_\_ D’’’:\_\_\_\_\_\_*

**STATION 4: Dilations**

**Rule:** where *f* represents the scale factor. This can also be represented as

1.If the scale factor is 3, how would you write the rule?

**2.** Triangle *ABC* has vertices *A* (0, 2), *B* (4, 4), and *C* (-1, 4). What are the vertices of its *image* with ?

**Scale Factor: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**New Vertices:**

*A’:\_\_\_\_\_\_ B’:\_\_\_\_\_ C\_\_\_\_\_\_*

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**3.** Quadrilateral *PQRS* has vertices *P* (-2, 4), *Q* (4, 4), *R* (4, -2), and *S* (- 4, - 4). The dilation is .

1. Draw Quadrilateral *PQRS*
2. What is the scale factor?
3. What are the coordinates of the image?

*P’:\_\_\_\_\_ Q’:\_\_\_\_ R’:\_\_\_\_\_ S’:\_\_\_\_*

1. Graph the new quadrilateral *P’Q’R’S*

**STATION 5: Proofs**

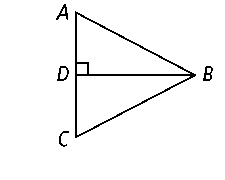
1. Write a two-column proof:

**Given:** ,

**Prove:** 

1. Write a proof for the following:

**Given:** *, D* is the midpoint of *.*

** **Prove:** 