#70F Ch7-3 Classwork Tokunaga's Geo Period: Name: _______________

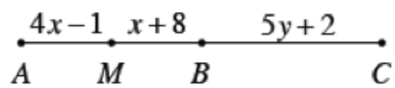
Objectives:

- How to find the midpoint of a line segment.
- How to use algebraic tools to explore quadrilaterals on coordinate axes.

W.Up (from #69 HW)

review

7-65. Point M is the midpoint of $\overline{AB}$ and B is the midpoint of $\overline{AC}$. What are the values of x and y? Show all work and reasoning.

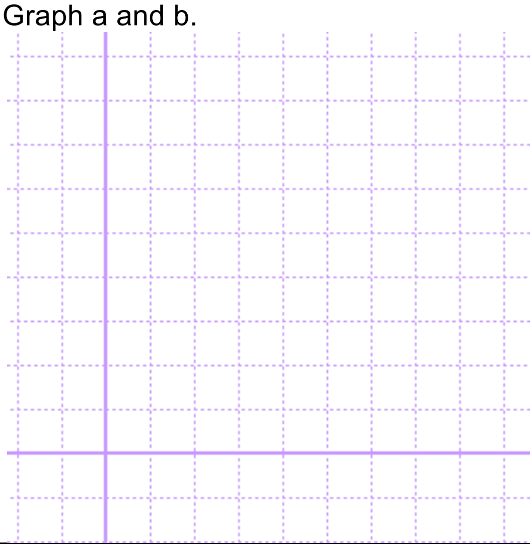


7-126. Cassie wants to confirm her theorem on triangle midsegments (from Lesson 7.2.6) using a coordinate grid. She started with ΔABC with $A(0, 0)$, $B(2, 6)$, and $C(7, 0)$.

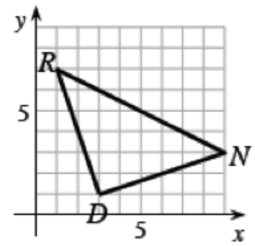
a. Graph ΔABC on graph paper.

b. With your team, find the coordinates of P, the midpoint of $\overline{AB}$. Likewise, find the coordinates of Q, the midpoint of $\overline{BC}$.

c. Prove that the length of the midsegment, $\overline{PQ}$, is half the length of $\overline{AC}$. Also verify that $\overline{PQ}$ is parallel to $\overline{AC}$.

Graph a and b.	Equations for c.
	

7-128. Randy has decided to study the triangle graphed at right.



a. Consider all the special properties this triangle can have. Without using any algebra tools, predict the best name for this triangle.

b. For your answer to part (a) to be correct, what is the minimum amount of information that must be true about ΔRND?

c. Use your algebra tools to verify each of the properties you listed in part (b). If you need, you may change your prediction of the shape of ΔRND.

d. Randy wonders if there is anything special about the midpoint of $\overline{RN}$. Find the midpoint M, and then find the lengths of $\overline{RM}$, $\overline{DM}$, and $\overline{MN}$. What do you notice?

a.
b.
c.
d.

7-138. MUST BE, COULD BE

Mr. Quincey has some new challenges for you! For each description below, decide what special type the quadrilateral *must be* and/or what special type the quadrilateral *could be*. Look out: Some descriptions may have no *must be* statements, and some descriptions may have many *could be* statements!

a. My quadrilateral has three right angles.

b. My quadrilateral has a pair of parallel sides.

c. My quadrilateral has two consecutive equal angles.

7-139

Your Task: For each of the quadrilateral orders listed below,

- Create a diagram of the quadrilateral on graph paper.
- Decide if the quadrilateral ordered has a special name. To help the shape-makers, your name must be as specific as possible. (For example, do not just call a shape a rectangle when it is also a square!)
- Record and be ready to present a proof that the quadrilateral ordered must be the kind you say it is. It is not enough to say that a quadrilateral *looks* like it is of a certain type or *looks* like it has a certain property. Customers will want to be sure they get the type of quadrilateral they ordered!

The orders:

a. A quadrilateral formed by the intersection of these lines:

$y=-\frac{3}{2}x+3$ $\quad$ $y=\frac{3}{2}x-3$ $\quad$ $y=-\frac{3}{2}x+9$ $\quad$ $y=\frac{3}{2}x+3$

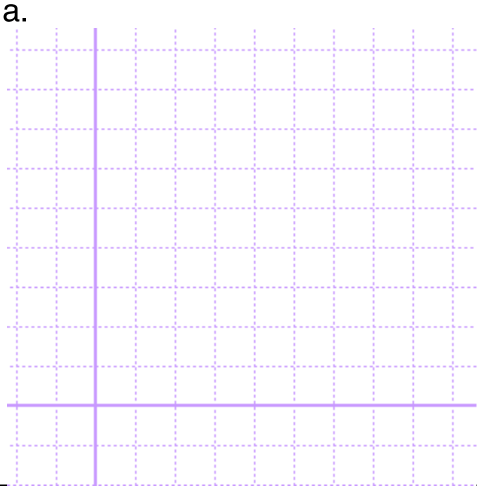
b. A quadrilateral with vertices at these points:

$A(0,2)$ $\quad$ $B(1,0)$ $\quad$ $C(7,3)$ $\quad$ $D(4,4)$

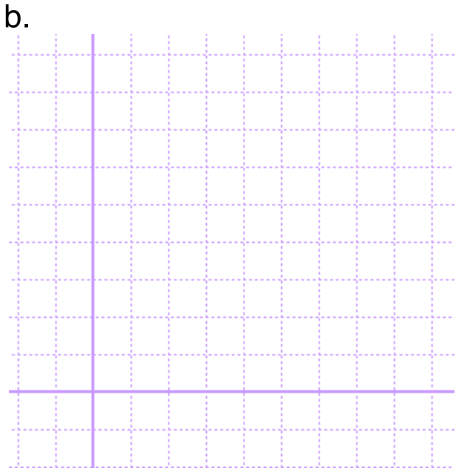
c. A quadrilateral with vertices at these points:

$W(0,5)$ $\quad$ $X(2,7)$ $\quad$ $Y(5,7)$ $\quad$ $Z(5,1)$

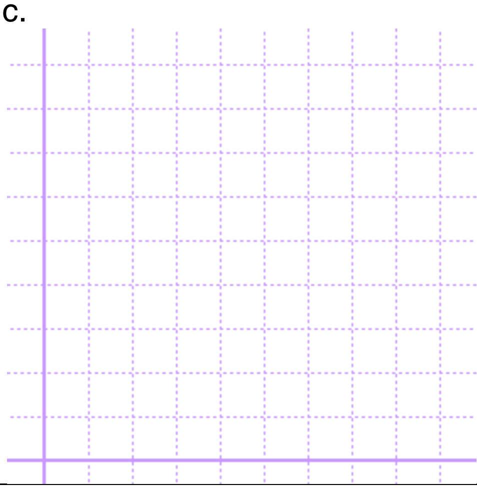
a.



b.



c.



7-131. Tomika remembers that the diagonals of a rhombus are perpendicular to each other.

a. Graph $ABCD$ if $A(1, 4)$, $B(6, 6)$, $C(4, 1)$, and $D(-1, -1)$. Is $ABCD$ a rhombus? Show how you know.

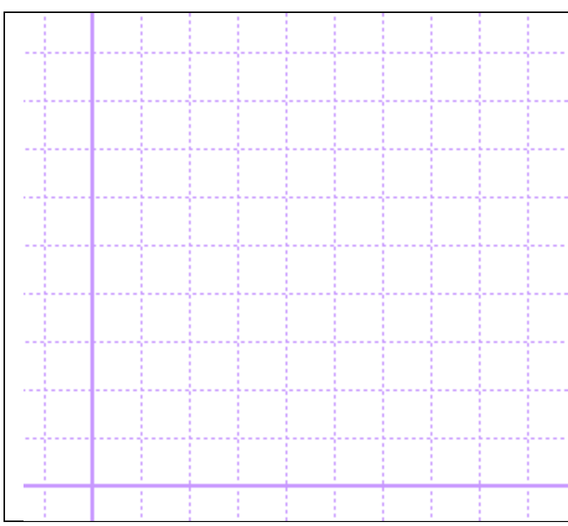
b. Find the equation of the lines on which the diagonals lie. That is, find the equations of $\overleftrightarrow{AC}$ and $\overleftrightarrow{BD}$.

c. Compare the slopes of $\overleftrightarrow{AC}$ and $\overleftrightarrow{BD}$. What do you notice?

7-135. Consider ΔABC with vertices $A(2, 3)$, $B(6, 6)$, and $C(8, -5)$.

a. Draw ΔABC on graph paper. What kind of triangle is ΔABC? Prove your result.

b. Reflect ΔABC across $\overline{AC}$. Find the location of B'. What name best describes the resulting figure? Prove your claim.



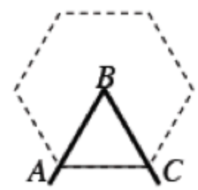
7-140. Each problem below gives the endpoints of a segment. Find the coordinates of the midpoint of the segment. If you need help, consult the Math Notes box for this lesson.

a. (5, 2) and (11, 14)

b. (3, 8) and (10, 4)

a.	b.

7-144. The angle created by a hinged mirror when forming a regular polygon is called a **central angle**. For example, $\angle ABC$ in the diagram at right is the central angle of the regular hexagon.



a. If the central angle of a regular polygon measures 18°, how many sides does the polygon have?

b. Can a central angle measure 90°? 180°? 13°? For each angle measure, explain how you know.