

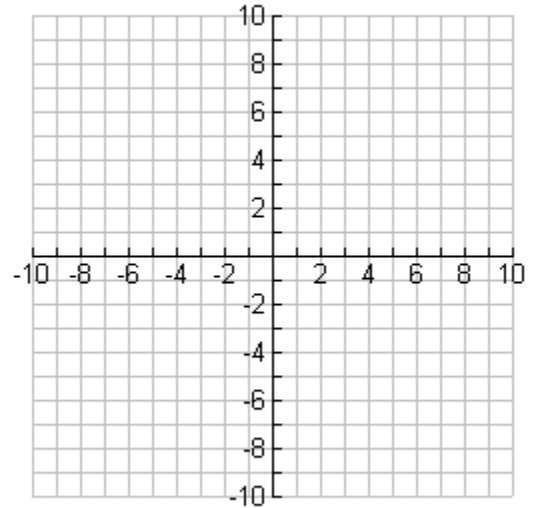
COORDINATE GEOMETRY #1

Have you ever been in the middle of a fight?
Why do you think candy makers put different tastes in the middle of the candy?
Would you rather sit in the middle, front, or back of an airplane?

Explore:

1. Let's consider the "middle" of a triangle.

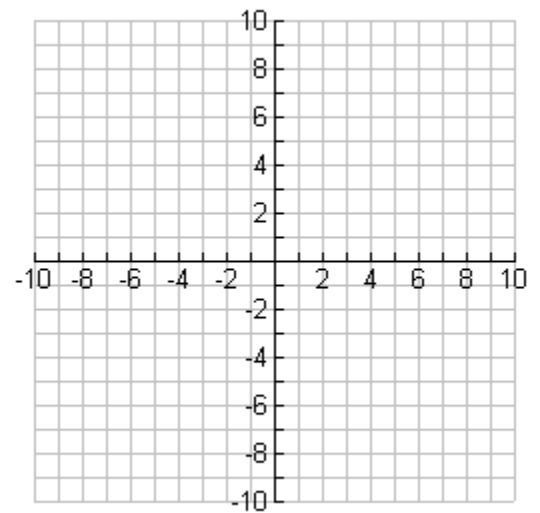
- Plot the points $A(-8, -8)$, $B(-4, 8)$, and $C(10, -6)$.
- Draw the triangle ABC . What type of triangle do you think it is?
- Find the midpoint of segment AB . Label it as point J .
- Draw in segment JK , where K is the midpoint of segment BC . (This segment is called a midsegment of triangle ABC .)
- What do you notice about segment JK in regard to
 - its length compared to other segments?



- its slope compared to other segments?
- Find another midsegment of triangle ABC . What do you notice about this segment in comparison to other segments?
 - Find the last midsegment of triangle ABC . What do you notice about this segment in comparison to other segments?
- h. Write a conjecture that you think might be true about the midsegments of a triangle.

2. Does this conjecture work for every triangle? Let's test a different one:

- a. Draw your own triangle. Find and label the coordinates of the vertices.
- b. Find and label the midpoints of each side.
- c. Draw in the midsegments.
- d. Show your conjecture is or is not true for each of the midsegments.



- Midsegment 1

- Midsegment 2

- Midsegment 3

3. Write a conjecture that you think is true for the midpoints of *any* triangle.

4. What do you think it would take to show this conjecture is true for *every* triangle?

5. Can you explain why it must be true for any triangle?