

LessonTitle: Solving for the Midpoint	Geo 8.0c
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Utah State Core Standard and Indicators	Geo Standard	Process Standards 1-5
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Summary

In this activity, students fold paper, draw and measure line segments to understand what a midpoint is and to derive the formula for finding the midpoint of a line segment.

<p style="text-align: center;">Enduring Understanding</p> <p>If you know the coordinate points for the two endpoints of a line segment, you can find the midpoint of the segment. You simply find the average of the x values and then the average of the y values—these two numbers are the x and y values of the midpoint.</p>	<p style="text-align: center;">Essential Questions</p> <p>How can you find the midpoint of a line without measuring?</p>
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<p style="text-align: center;">Skill Focus</p> <p>Finding midpoints of line segments using a coordinate grid.</p>	<p style="text-align: center;">Vocabulary Focus</p>
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Assessment

Materials

Launch

Explore

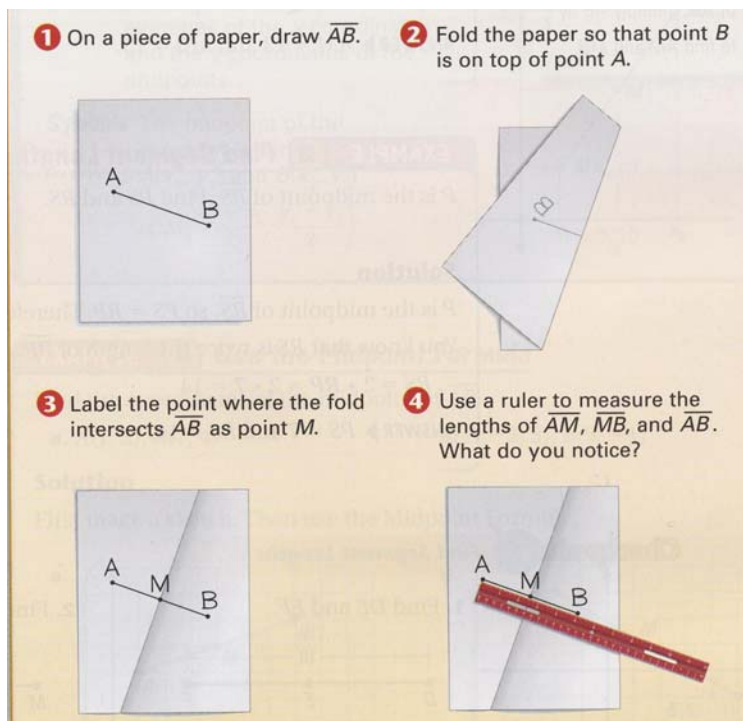
What do you notice about the x values for the midpoints of the horizontal lines?
What do you notice about the y values for the midpoints of the vertical lines?
What could you do with the endpoint x and y values to find the midpoint coordinate?

Summarize

Apply

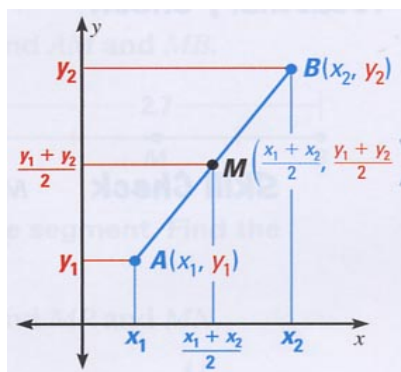
Directions:

Follow the directions below to 1) help students experience what a midpoint of a line is and 2) to derive the formula for finding a midpoint when two coordinate points are known.



Have the students discuss what the midpoint is and how they know that point M is the midpoint of the line.

Next, have the students' draw 3 horizontal line segments and 2 vertical line segments on a piece of grid paper. Have them find and label the coordinates of the endpoints and then have them determine what the coordinates of the midpoint will be. Have them place the coordinates in a table and discuss what patterns they see among the endpoints and midpoints. If they do not see a pattern among the points then give them a hint (adding the x-coordinates, adding the y-coordinates). After they have discovered the pattern $((x_1 + x_2)/2, (y_1 + y_2)/2)$ then have them draw 4 line segments that are not horizontal or vertical and have them use their rule to find the midpoint of the line. You could then show them the following diagram to illustrate the midpoint of a line segment and what they discovered.

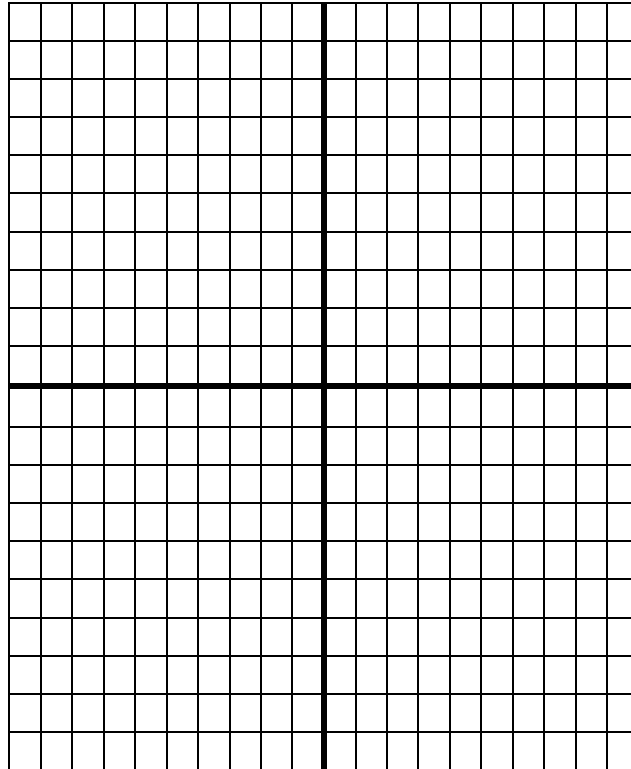


Finding the Midpoint of a Line Segment



Name _____ Date _____ Period ____

Draw 3 horizontal line segments and 2 vertical line segments on the coordinate grid



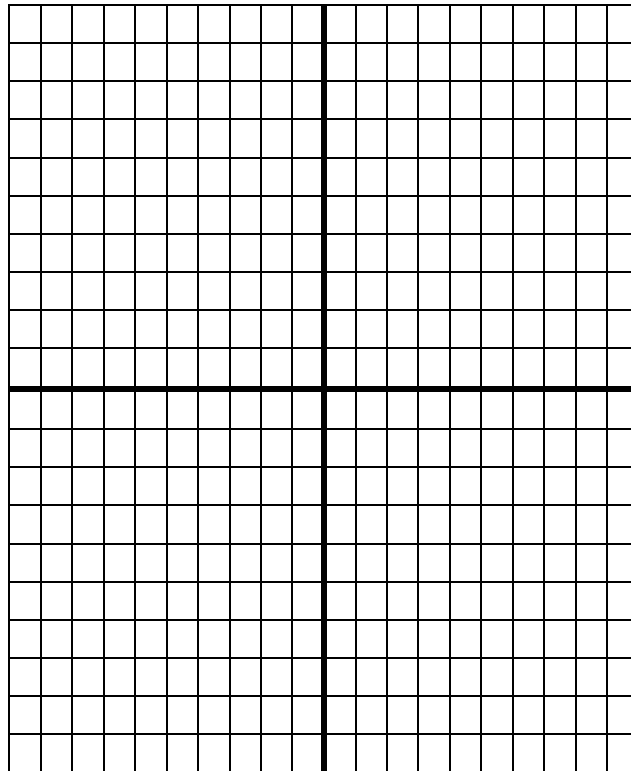
List the coordinates of the endpoints and the coordinates of each midpoint in the table.

<i>Endpoint 1</i>	<i>Endpoint 2</i>	<i>Midpoint</i>

What patterns do you see when you look at the endpoints and their midpoint?

What rule could you write to show the pattern you discovered?

Draw 4 line segments on the grid below that are not horizontal or vertical. Make sure that you use each of the quadrants.



Using the rule you discovered, show how you would find the midpoint of each line segment in the space below.

Line 1:

Line 2:

Line 3:

Line 4:

Write a paragraph to your friend about how they could find the midpoint of a line segment given the endpoints $(0, -3)$ and $(4, 5)$.