Lesson 12: Using Equations for Lines

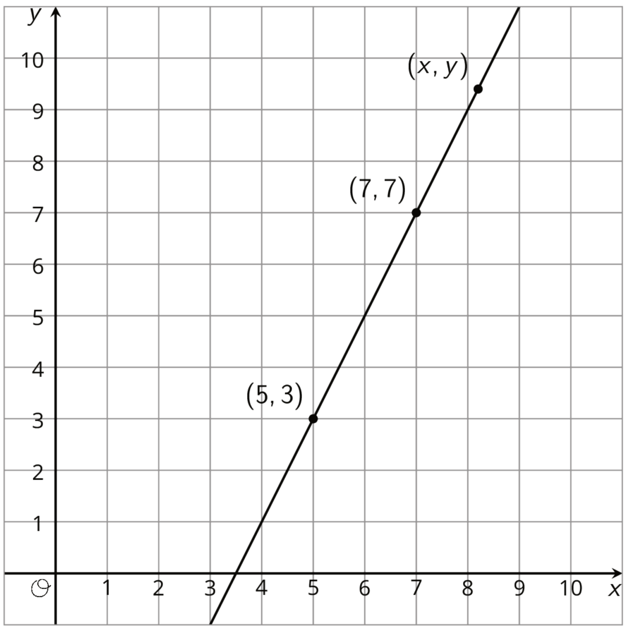
Let's write equations for lines.

12.1: Missing center

A dilation with scale factor 2 sends A to B. Where is the center of the dilation?

12.2: Writing Relationships from Two Points

Here is a line.



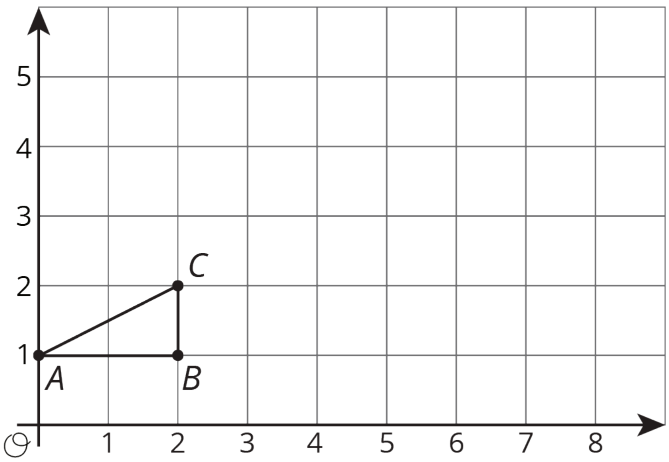
1. Using what you know about similar triangles, find an equation for the line in the diagram.
2. What is the slope of this line? Does it appear in your equation?
3. Is $(9, 11)$ also on the line? How do you know?
4. Is $(100, 193)$ also on the line?

Are you ready for more?

There are many different ways to write down an equation for a line like the one in the problem. Does $\frac{y-3}{x-6} = 2$ represent the line? What about $\frac{y-6}{x-4} = 5$? What about $\frac{y+5}{x-1} = 2$? Explain your reasoning.

12.3: Dilations and Slope Triangles

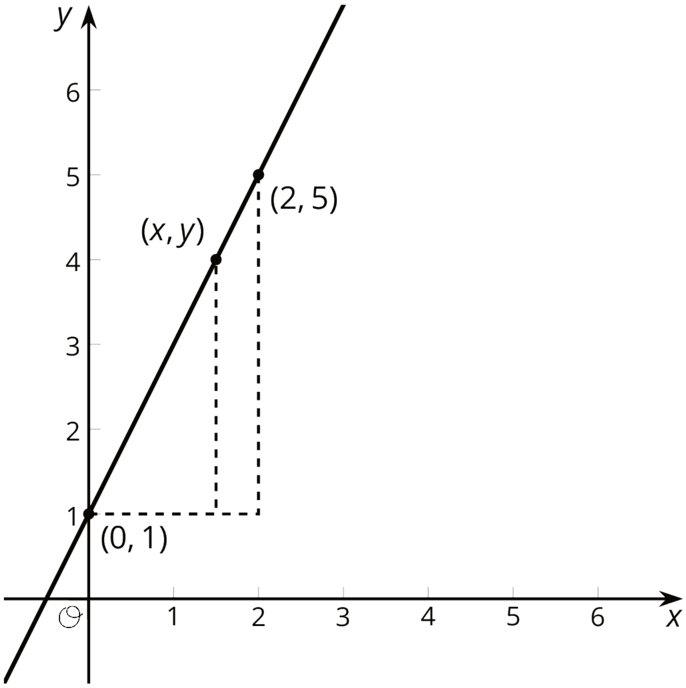
Here is triangle ABC.



1. Draw the dilation of triangle ABC with center $(0, 1)$ and scale factor 2.
2. Draw the dilation of triangle ABC with center $(0, 1)$ and scale factor 2.5.
3. Where is C mapped by the dilation with center $(0, 1)$ and scale factor s?
4. For which scale factor does the dilation with center $(0, 1)$ send C to $(9, 5.5)$? Explain how you know.

Lesson 12 Summary

We can use what we know about slope to decide if a point lies on a line. Here is a line with a few points labeled.



The slope triangle with vertices $(0, 1)$ and $(2, 5)$ gives a slope of $\frac{5-1}{2-0} = 2$. The slope triangle with vertices $(0, 1)$ and (x, y) gives a slope of $\frac{y-1}{x}$. Since these slopes are the same, $\frac{y-1}{x} = 2$ is an equation for the line. So, if we want to check whether or not the point $(11, 23)$ lies on this line, we can check that $\frac{23-1}{11} = 2$. Since $(11, 23)$ is a solution to the equation, it is on the line!