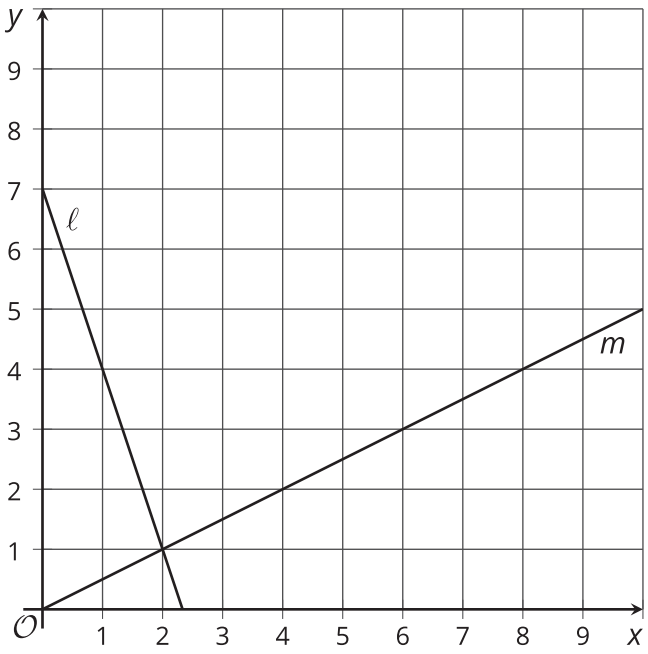
Unit 3, Lesson 11

Line Designs

Let's describe lines.

11.1 Comparing Lines

What is the same about the two lines? What is different about the two lines?



CC BY NC Illustrative Mathematics, based on IM 6–8 Math, CC BY Open Up Resources.

11.2 Making Designs

Your teacher will give you either a design or a blank graph. Do not show your card to your partner.

If your teacher gives you the design:

1. Look at the design silently and think about how you could communicate what your partner should draw. Think about ways that you can describe what a line looks like, such as its slope or points that it goes through.
2. Describe each line, one at a time, and give your partner time to draw them.
3. Once your partner thinks they have drawn all the lines you described, only then should you show them the design.

If your teacher gives you the blank graph:

1. Listen carefully as your partner describes each line, and draw each line based on their description.
2. You are not allowed to ask for more information about a line than what your partner tells you.
3. Do not show your drawing to your partner until you have finished drawing all the lines they describe.

When finished, place the drawing next to the card with the design so that you and your partner can both see them. How is the drawing the same as the design? How is it different? Discuss any miscommunication that might have caused the drawing to look different from the design.

Pause here so your teacher can review your work. When your teacher gives you a new set of cards, switch roles for the second problem.

11.3 Calculate the Slope

Calculate the slope of the line that passes through each pair of points.

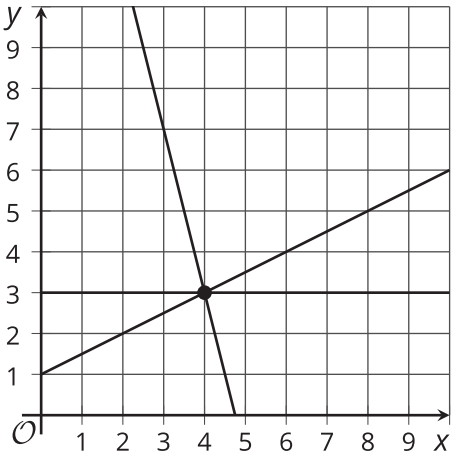
1. $(-5, -7)$ and $(1, -3)$

2. $(-10, 15)$ and $(-8, 1)$

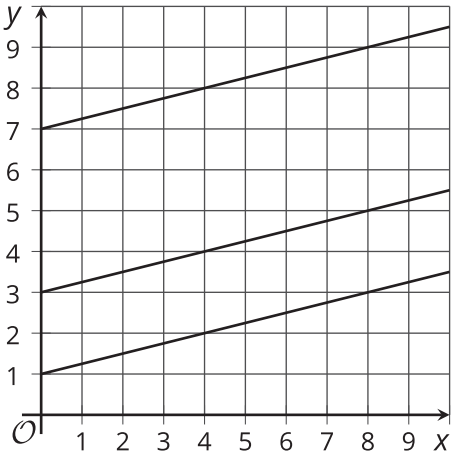
Lesson 11 Summary

In order to draw a specific line, knowing one point that the line passes through is not enough information. We would know where to draw the line, but it could have any slope.

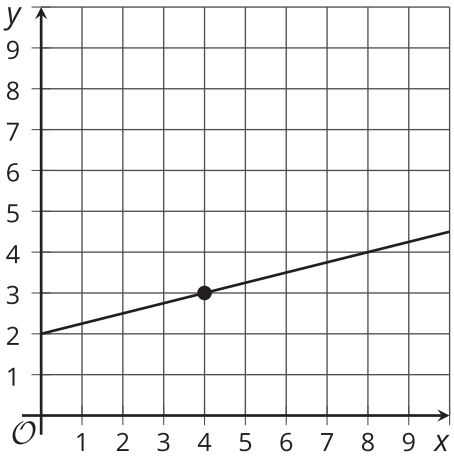
For example, these lines all go through the point $(4, 3)$.



If we knew only the slope of a line, we would know how to draw it but the line could be located anywhere. For example, these lines all have a slope of $\frac{1}{4}$.



To know the exact location of a line, we need either both the slope and the coordinates of one point on the line, or the locations of at least 2 points that are on the line. For example, this line goes through the point $(4, 3)$ and has a slope of $\frac{1}{4}$. This line could also be described as the line that passes through $(4, 3)$ and $(8, 4)$.



CC BY NC Illustrative Mathematics, based on IM 6–8 Math, CC BY Open Up Resources.