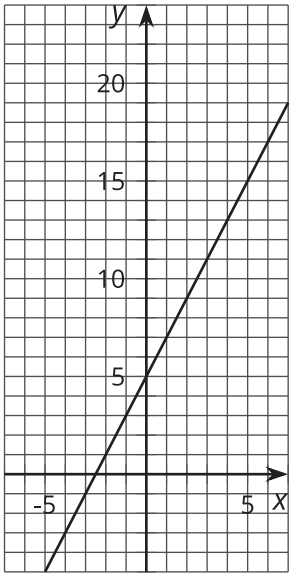
Unit 7, Lesson 10

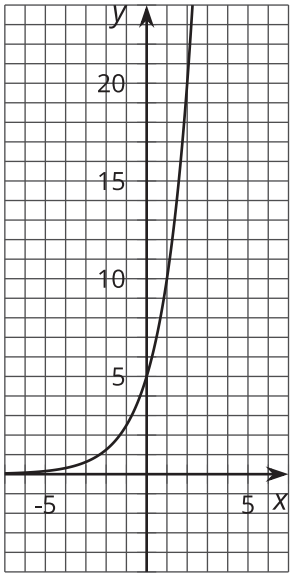
Relating Linear Equations and Their Graphs

Let's connect functions to features of their graphs.

10.1 Notice and Wonder: Features of Graphs

Here are graphs of $y = 2x + 5$ and $y = 5 \cdot 2^x$.



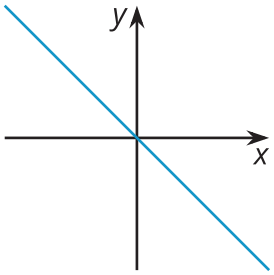


What do you notice? What do you wonder?

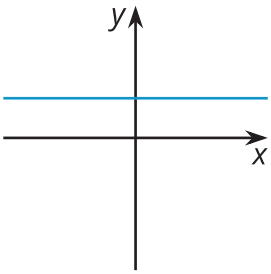
10.2 Making Connections

1. Here are some equations and graphs. Match each graph to one or more equations that it *could* represent. Be prepared to explain how you know.

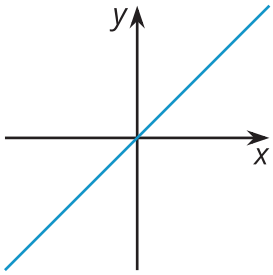
A



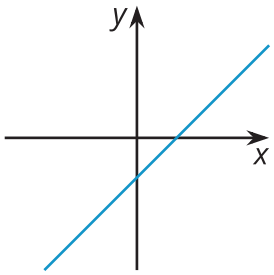
B



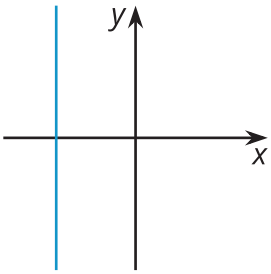
C



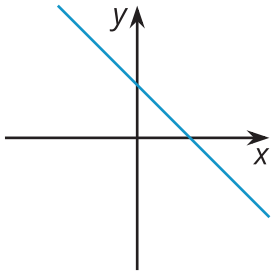
D



E



F

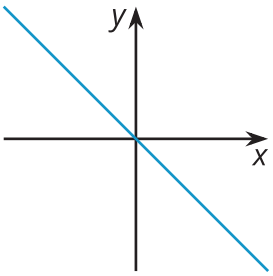


- $y = 8$
- $y = 3x - 2$
- $x + y = 6$
- $0.5x = -4$
- $y = x$
- $-\frac{2}{3}x = y$
- $12 - 4x = y$
- $x - y = 12$
- $2x + 4y = 16$
- $3x = 5y$

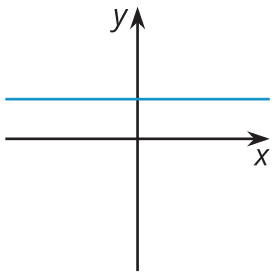
2. Choose either Graph D or F. Let x represent hours after noon on a given day and y represent the temperature in degrees Celsius in a freezer.
   - In this situation, what does the y-intercept mean, if anything?
   - In this situation, what does the x-intercept mean, if anything?

10.3 Connecting Equations and Graphs

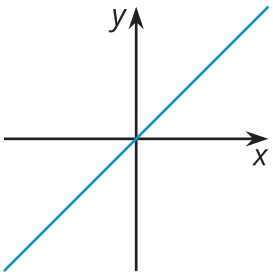
A



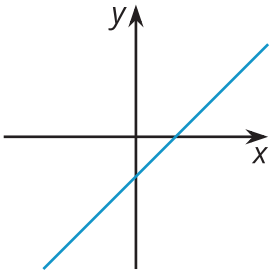
B



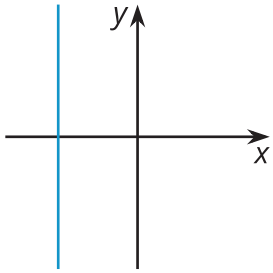
C



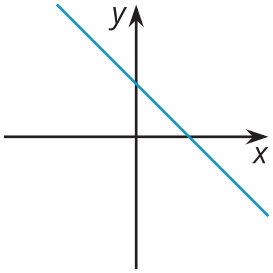
D



E



F



1. Without substituting any values for x and y or using technology, decide whether Graph A could represent each equation, and explain how you know.
   a. $4x = y$

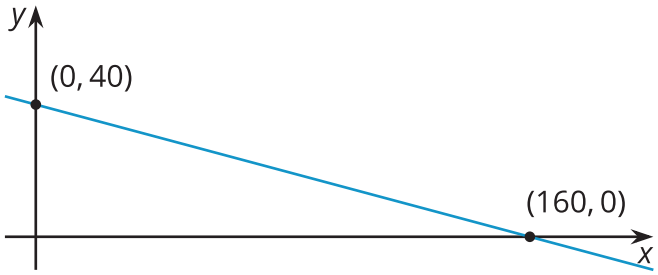
   b. $x - 8 = y$

   c. $-5x = 10y$

   d. $3y - 12 = 0$

2. Write a new equation that could be represented by:
   a. Graph D
   b. Graph F

3. On this graph, x represents minutes since midnight and y represents temperature in degrees Fahrenheit.



a. Explain what the intercepts tell us about the situation.

b. Write an equation that relates the two quantities.