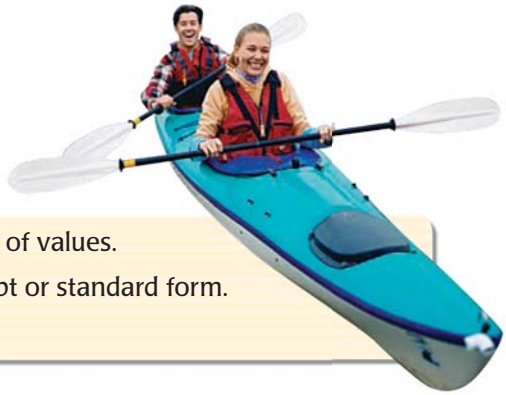
2.3 Graph Equations of Lines

TEKS a.5, 2A.4.A, 2A.4.B



Before You graphed linear equations by making tables of values.

Now You will graph linear equations in slope-intercept or standard form.

Why? So you can model motion, as in Ex. 64.

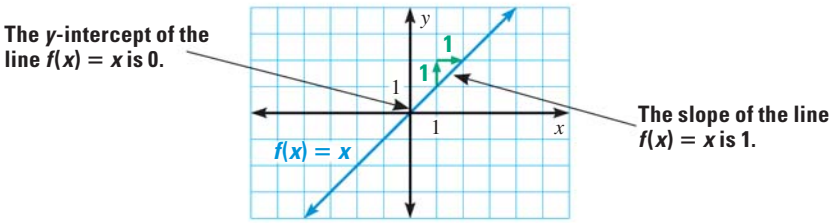
Key Vocabulary
- **parent function**
- ***y*-intercept**
- **slope-intercept form**
- **standard form of a linear equation**
- ***x*-intercept**

A *family* of functions is a group of functions with shared characteristics. The **parent function** is the most basic function in a family.

KEY CONCEPT *For Your Notebook*

Parent Function for Linear Functions

The parent function for the family of all linear functions is $f(x) = x$. The graph of $f(x) = x$ is shown.



In general, a **y-intercept** of a graph is the y-coordinate of a point where the graph intersects the y-axis.

DEFINE *y*-INTERCEPT

A y-intercept is sometimes defined as a *point* where a graph intersects the y-axis. Using this definition, the y-intercept of the line $f(x) = x$ is (0, 0), not 0.

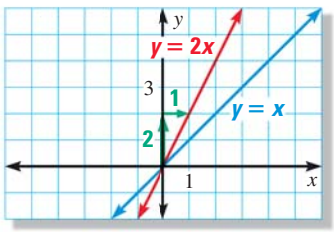
EXAMPLE 1 Graph linear functions

Graph the equation. Compare the graph with the graph of $y = x$.

a. $y = 2x$ **b.** $y = x + 3$

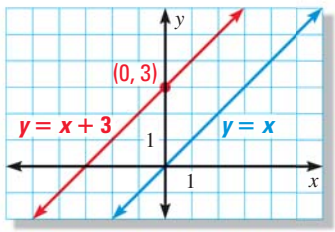
Solution

a.



The graphs of $y = 2x$ and $y = x$ both have a y-intercept of 0, but the graph of $y = 2x$ has a slope of 2 instead of 1.

b.



The graphs of $y = x + 3$ and $y = x$ both have a slope of 1, but the graph of $y = x + 3$ has a y-intercept of 3 instead of 0.