

using table or t-chart	Using two points	<table><tr><td>x</td><td>y</td></tr><tr><td>2</td><td>...</td></tr><tr><td>3</td><td>...</td></tr><tr><td>-2</td><td>...</td></tr></table>	x	y	2	...	3	...	-2	...
x	y									
2	...									
3	...									
-2	...									
Graph by finding x- y- intercepts	Graph using intercepts	$(0, y) \leftarrow y\text{-int.}$ $(x, 0) \leftarrow x\text{-int.}$								
Graph by finding Slope & y-intercept	Graph using Slope-intercept form	$y = \underbrace{m}_{\text{slope}} x + \underbrace{b}_{y\text{-int.}}$								

# Graphing Linear Functions:

$$f(x) = mx + b$$

$x = a$  is a linear equation  
but NOT a function

Function notation

$$f(g) = 2g - 4 ; f(g) = 16$$

Find an x-value

$$16 = 2g - 4$$

$$\begin{array}{r} 16 \\ +4 \\ \hline 20 \end{array} = \begin{array}{r} 2g \\ -4 \\ +4 \\ \hline 2g \end{array}$$

$$\boxed{g = 10}$$

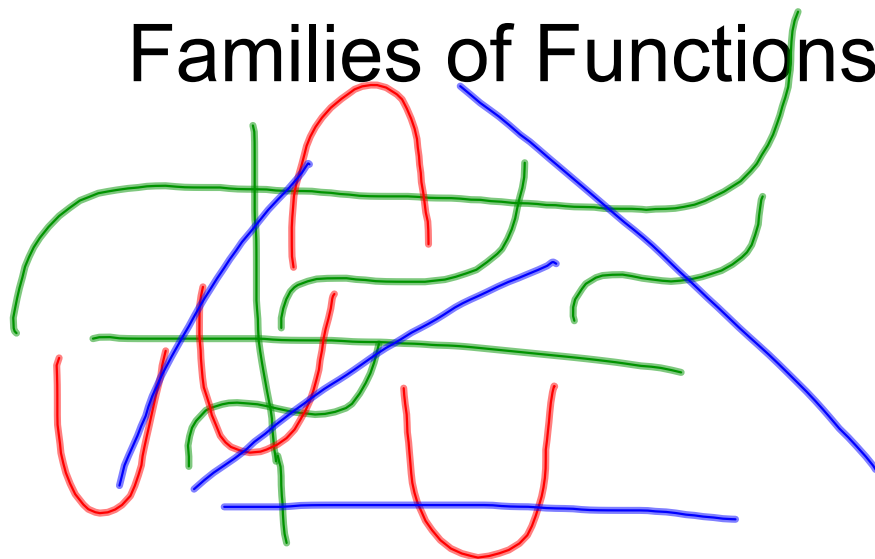
• domain: the possible x-values

• range: the possible outputs

Domain and range

$$f(x) = 2x + 25$$

## Families of Functions:

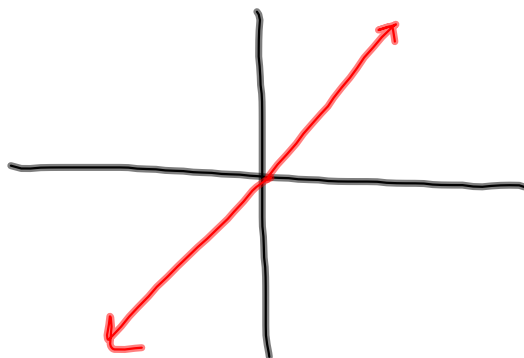


Similar characteristics  
(ex. linear functions)

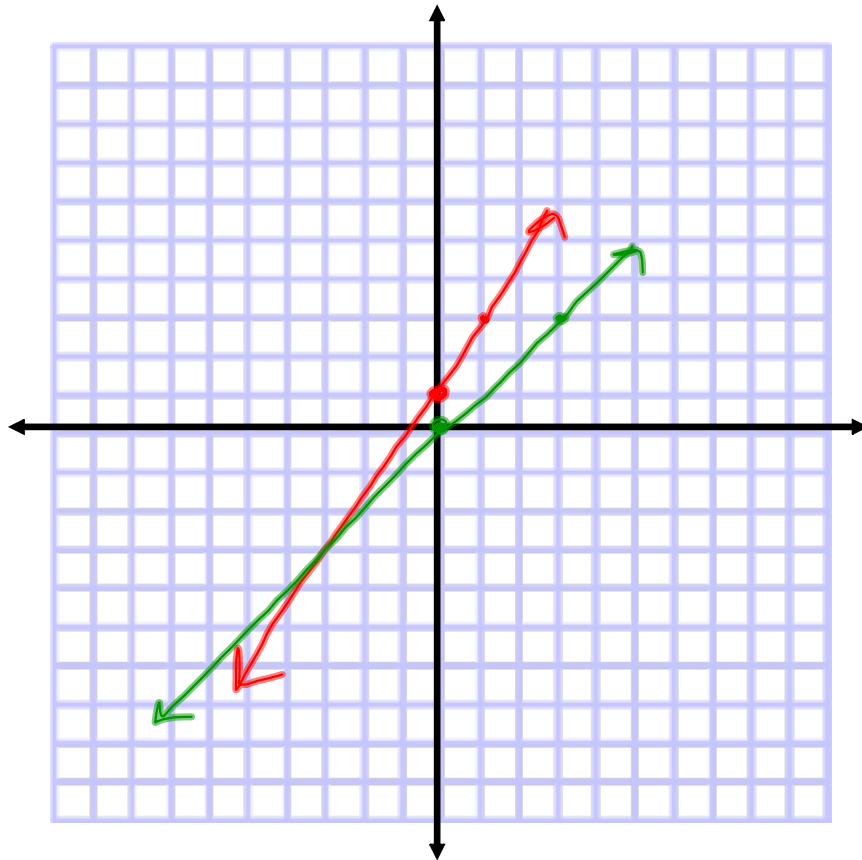
The most basic  
linear function:

Parent function

$$f(x) = x$$
$$f(x) = 1x + 0$$



# Graphing and Comparing Linear Functions



Graph as always ...

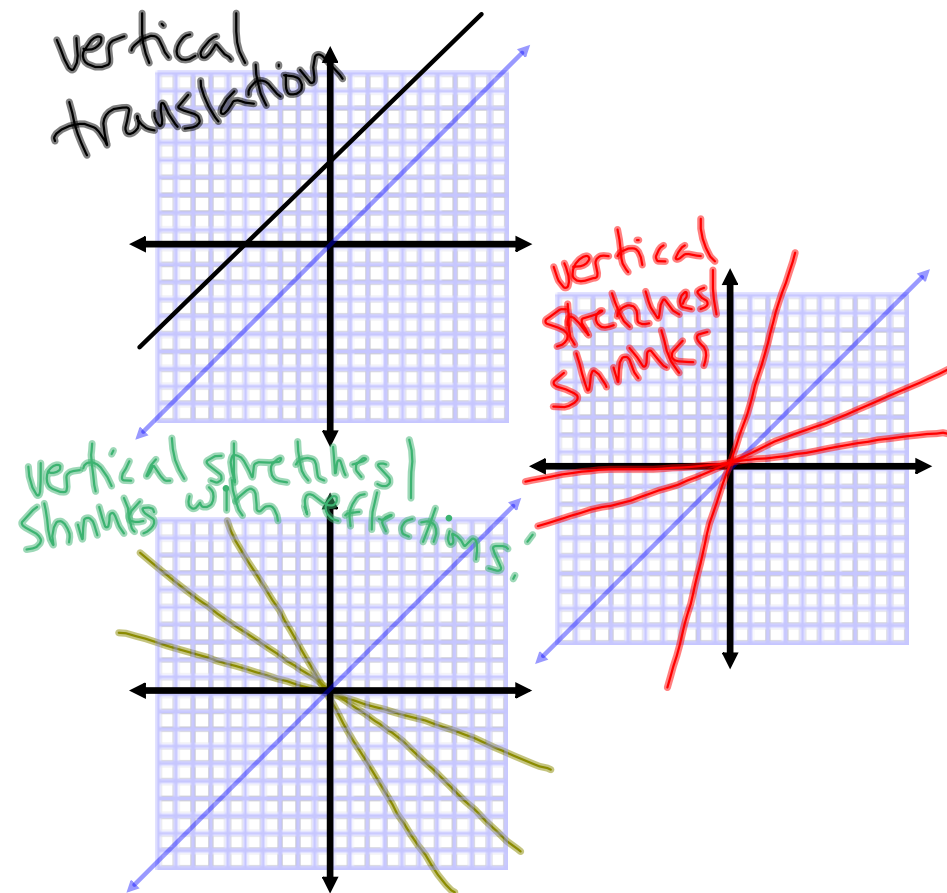
$$f(g) = 2g + 1$$

- steeper slope
- lifted up (higher y-int.)

Compare to parent function

$$f(g) = g$$

# Comparing Linear Functions, continued...



Vertical Translations

$$g(x) = x + b$$

Vertical Stretches or Shrinks

$$g(x) = mx \text{ where } m > 0$$

Vertical Stretches or Shrinks  
with Reflections

$$g(x) = mx \text{ where } m < 0$$

**Evaluate the function when  $x = -3, 0,$  and  $2$ .**

1.  $f(x) = 15x + 4$

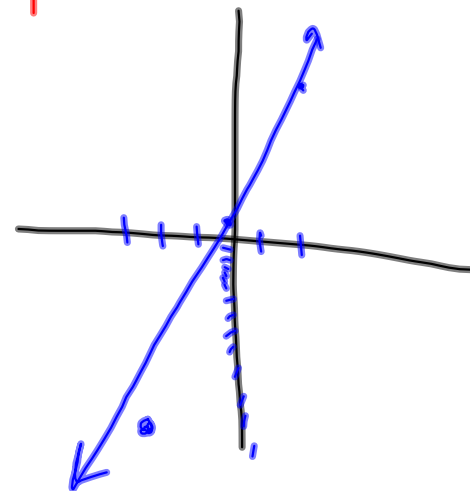
2.  $g(x) = -9x + 1$

3.  $p(x) = -7x - 5$

4.  $h(x) = 3.25x$

①  $f(x) = 15(-3) + 4$   
 $= -45 + 4$   
 $= -41$   
 $(-3, -41)$

$15(0) + 4$   
 $0 + 4$   
 $4$   
 $(0, 4)$



**Find the value of  $x$  so that the function has the given value.**

13.  $f(x) = 4x - 2$ ;  $\boxed{18} = f(x)$

14.  $n(x) = 7x + 4$ ; 39

15.  $q(x) = 6 - 5x$ ; 21

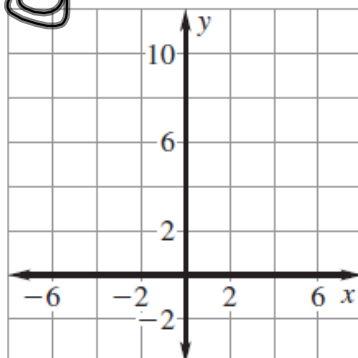
16.  $g(x) = -3x + 8$ ; 14

⑬  $f(x) = 4x - 2$   
 $x = \boxed{5}$

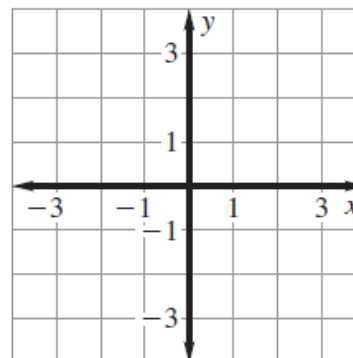
$$\begin{array}{r} 18 = 4x - 2 \\ +2 \quad \quad +2 \\ \hline 20 = 4x \\ \frac{20}{4} = \frac{4x}{4} \end{array} \quad \textcircled{x=5}$$

$$\underset{\uparrow}{f}(\underset{\uparrow}{x}) = 4\underset{\uparrow}{x} - 2$$

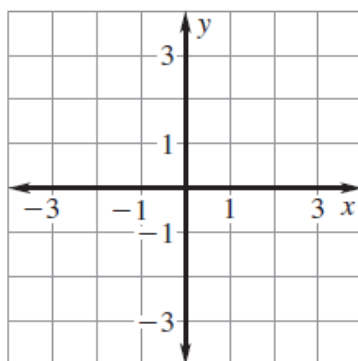
24. ~~g(x)~~  $y = x + 7$



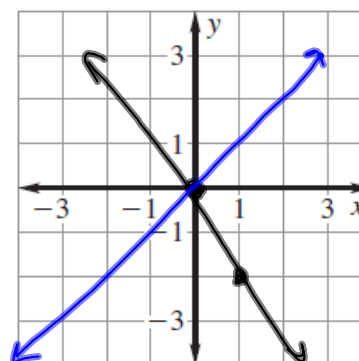
25.  $m(x) = 5x$



27.  $p(x) = \frac{1}{3}x$



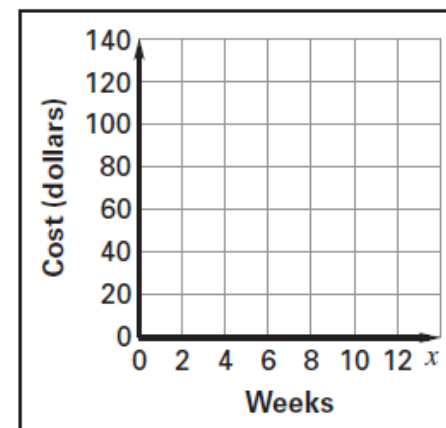
28.  $n(x) = -2x$





**Pool Membership** A pool membership during the summer costs \$7 per week. The total cost of a membership is given by  $f(x) =$  . The pool also rents out lockers for \$2 per week. The total cost of a membership and a rental is given by  $g(x) =$  .

- a. Graph both functions. How is the graph of  $f$  related to the graph of  $g$ ?
- b. What is the difference between a 12-week membership if you get a locker and if you don't? *Explain* how you got your answer.



Homework:

p. 265, 23-32 by 3, 40, 41, 43