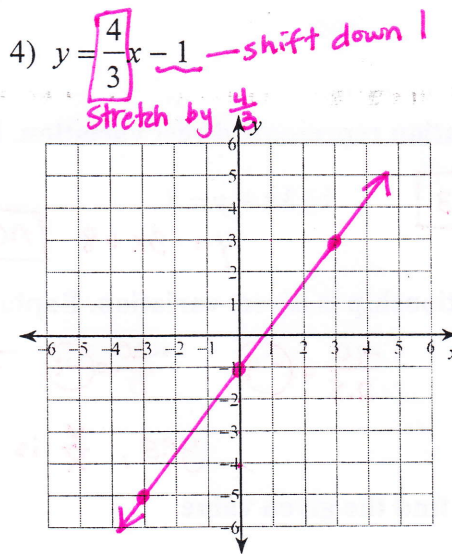
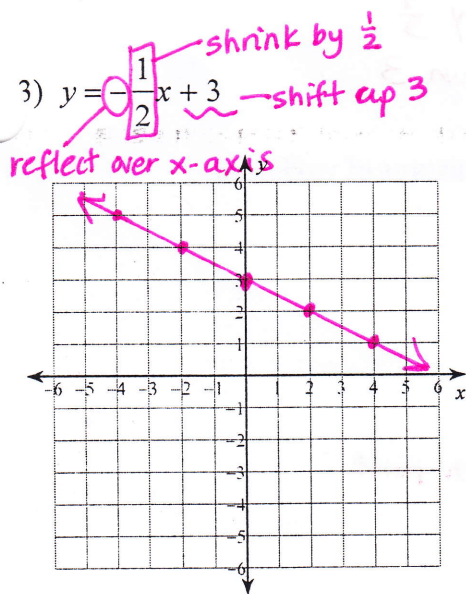
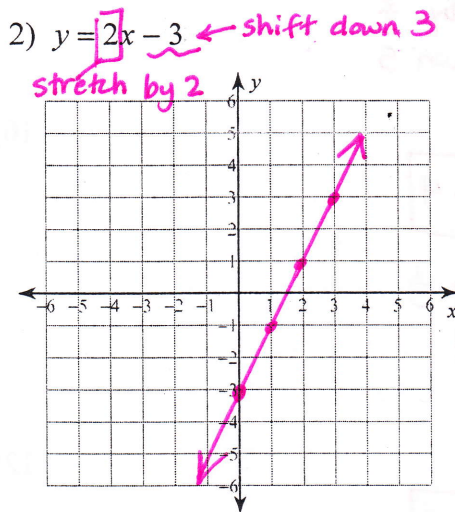
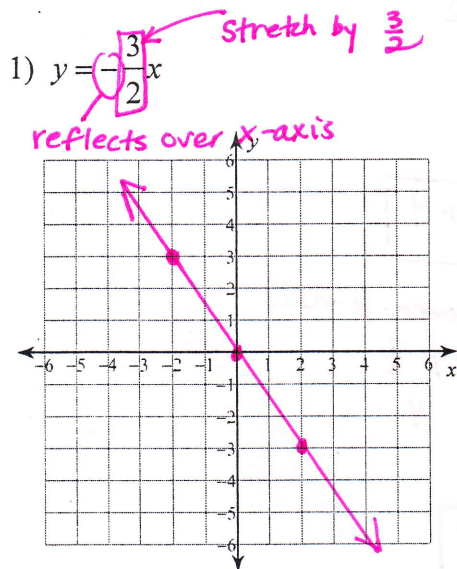


9.2-- Transformations of Functions

Graph each line. Then compare the graph with the graph of  $y = x$ . In other words, describe the transformations that take place (shift, stretch, shrink, and/or reflect).



Put each equation in slope-intercept form. Then compare the graphs of each to the graph of  $y = x$ , comparing the transformations that take place (shift, stretch, shrink, and/or reflect).

5)  $x - 2y = -6$

$y = \frac{1}{2}x + 3$

- shrink by  $\frac{1}{2}$
- shift up 3

6)  $7x - y = 4$

$y = 7x - 4$

- stretch by 7
- shift down 4

7)  $5x + 2y = -10$

$$y = -\frac{5}{2}x - 5$$

- reflect over x-axis
- stretch by  $\frac{5}{2}$
- shift down 5

8)  $x + y = 2$

$$y = -x + 2$$

- reflect over x-axis
- shift up 2

9)  $x - 5y = -20$

$$y = \frac{1}{5}x + 4$$

- shrink by  $\frac{1}{5}$
- shift up 4

10)  $x + 5y = 20$

$$y = -\frac{1}{5}x + 4$$

- reflect over x-axis
- shrink by  $\frac{1}{5}$
- shift up 4

11)  $6x - 5y = -10$

$$y = \frac{6}{5}x + 2$$

- stretch by  $\frac{6}{5}$
- shift up 2

12)  $7x + 3y = -9$

$$y = -\frac{7}{3}x - 3$$

- reflect over x-axis
- stretch by  $\frac{7}{3}$
- shift down 3

Tell whether each equation represents direct variation. If so, identify the constant of variation.

13) a)  $y = 3x$

yes; 3

b)  $3x + y = 8$

$$y = -3x + 8$$

no

Tell whether each relationship is direct variation. Explain.

x	2.5	5	7.5
y	-10	-20	-30

$$\frac{-10}{2.5} = (-4)$$

$$\frac{-20}{5} = (-4)$$

$$\frac{-30}{7.5} = (-4)$$

yes,  $\frac{y}{x}$  is the same for each point

Use direct variation to find the given value

15) The value of  $y$  varies directly with  $x$  and  $y = 21$  when  $x = 7$ . Find  $y$  when  $x = 4$ .

$$y = mx \text{ or } y = kx$$

$$21 = k \cdot 7$$

$$k = 3$$

$$y = 3 \cdot 4$$

$$y = 12$$

or

$$\frac{21}{7} = \frac{y}{4}$$

$$7y = 84$$

$$y = 12$$