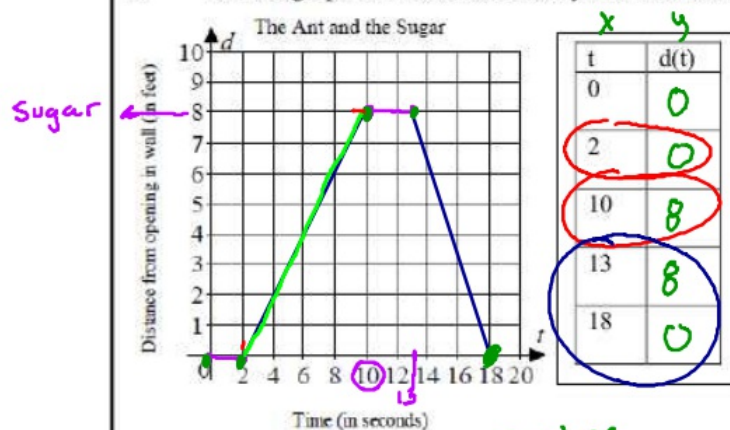


Page 5

A second ant slips through the wall onto the kitchen counter at time  $t = 2$  seconds and for 8 seconds follows the trail directly to the sugar (which is 8 feet away). The ant collects sugar for 3 seconds and crawls directly back to the wall entrance. The return from the sugar to the wall takes 5 seconds.

1. Draw a graph to illustrate the story and then complete the table.



2. Find the average rate of change of the Ant during the interval(s) it is heading toward the sugar.

slope

$$\frac{8}{8} = 1 \text{ ft/sec}$$

$$\frac{0-8}{2-10} = \frac{-8}{-8} = 1 \text{ ft/sec}$$

3. At what intervals is the slope negative. What is the slope on those intervals.

time

$$t = 13 \text{ to } t = 18$$

$$\frac{8-0}{13-18} = \frac{8}{-5} = -\frac{8}{5} \text{ ft/sec}$$

4. At what intervals is the slope positive. What is the slope on those intervals.

$$t = 2 \text{ to } t = 10 \quad \text{slope} = 1 \text{ ft/sec}$$

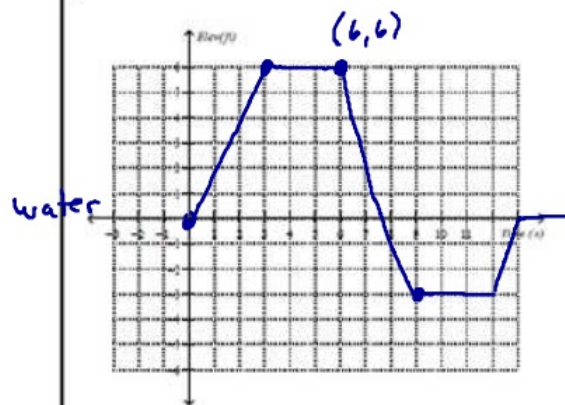
5. At what intervals is the slope constant. What is the slope on those intervals.

$$t = 0 \text{ to } t = 2 \quad \text{slope} = 0 \text{ ft/sec}$$

$$t = 10 \text{ to } t = 13$$

Graph the following situation:

A swimmer climbs a ladder for 3 seconds to a waterslide that is 6 feet high. She sits for 3 seconds at the top of the slide, and then slides 9 feet down the slide into the water in 3 seconds. She stayed steady at the same position underwater for 3 seconds before rising to the surface of the water in 1 second. She remained in the pool for 2 more seconds.



times

X	y
3	6
6	6
9	-3
12	-3
13	0
15	0

- Determine the average rate of change for the swimmer going up the ladder.
- During what time interval is the slope negative?
- At what time is the slope zero?
- Determine when the slope is positive.

Example 3: Slope-Intercept Form of Linear Equations:

$$y = mx + b$$

( $m$  stands for slope and  $b$  stands for y-intercept)

1.  $y = 4x + 7$

slope  $\frac{4}{1}$  y-intercept  $7$

2.  $y = 3x - 8$

slope  $\frac{3}{1}$  y-intercept  $-8$

3.  $y = 6 - 7x$

slope  $-7$  y-intercept  $6$

4.  $y = 10x$

slope  $\frac{10}{1}$  y-intercept  $0$

5.  $y = 12 + 0x$

slope  $0$  y-intercept  $12$

5a.  $x = 3$

slope undefined y-int none

6. Given slope of  $\frac{2}{9}$  and the y-intercept is 3.

$$y = \frac{2}{9}x + 3$$

7. Given slope of 0 and the y-intercept is 1.

$$y = 0x + 1 \quad y = 1$$

8. Given  $m = -1$  and  $b = -6$ .

$$y = -1x - 6$$

9. Given  $m = -\frac{2}{3}$  and  $b = 5$ .

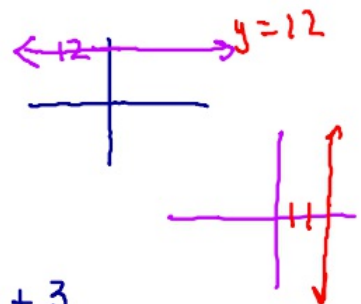
$$y = -\frac{2}{3}x + 5$$

10. Given  $m = -4$  and the y-intercept is  $(0, 2)$ .

$$y = -4x + 2$$

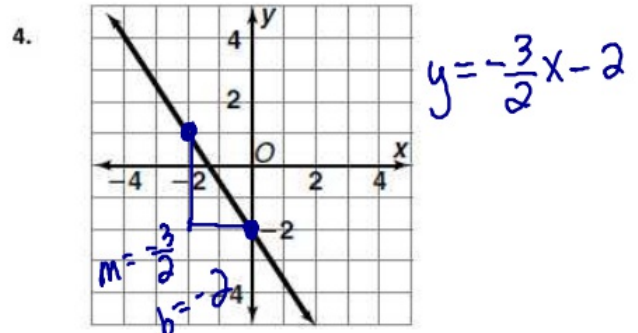
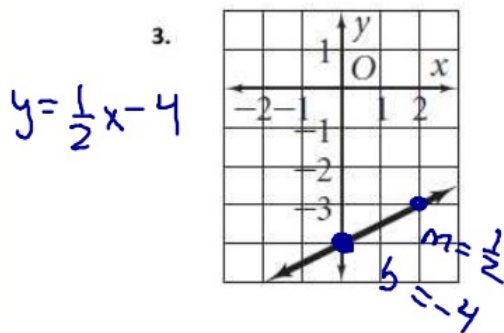
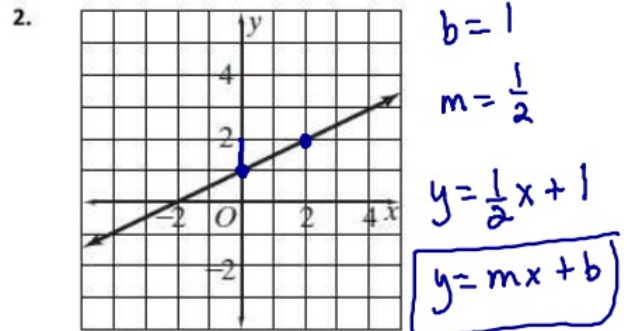
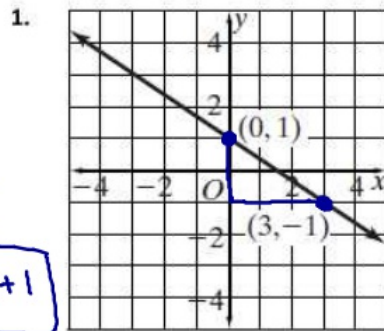
11. Given slope of 0.4 and  $b = 0.6$

$$y = .4x + .6$$



# Writing Linear Equations

Use the graph to determine the linear equation.



Use the table to determine the linear equation in slope-intercept form.

1.  $y$ -int:  $x = 0$

Handwritten calculations:

$$y = mx + b$$

$$m = \frac{\Delta y}{\Delta x} = \frac{8}{4} = 2$$

$$y\text{-int} \rightarrow 0, 4$$

$$y = 2x + 4$$

x	y
-6	-8
-2	0
2	8

x	y
-2	-7
-1	-3
0	1
1	5

Handwritten calculations:

$$\frac{\Delta y}{\Delta x} = \frac{4}{1}$$

$y$ -int

$$y = 4x + 1$$