

## 6.1 Equation of a Line in Slope y-intercept Form

MPM1D

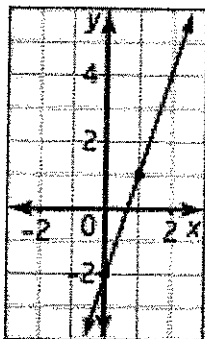
Jensen

1. Identify the slope and the y-intercept of each line:

Equation	Slope	y-intercept
a) $y = 4x + 1$	$m = 4$	$b = 1$
b) $y = \frac{2}{3}x + 3$	$m = \frac{2}{3}$	$b = 3$
c) $y = x - 2$	$m = 1$	$b = -2$
d) $y = -\frac{2}{3}x$	$m = -\frac{2}{3}$	$b = 0$
e) $y = 3$	$m = 0$	$b = 3$
f) $y = -x - \frac{1}{2}$	$m = -1$	$b = -\frac{1}{2}$

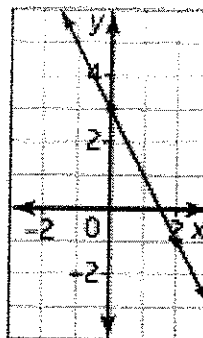
2. Find the slope and y-intercept of each line:

a)



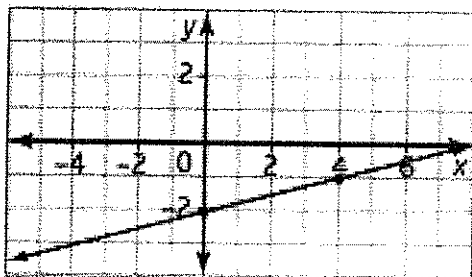
$$m = 3$$
$$b = -2$$

b)



$$m = \frac{-3}{2} = -1.5$$
$$b = 3$$

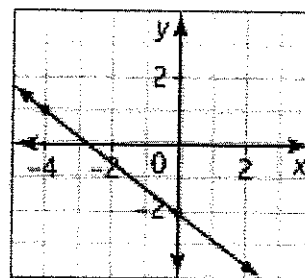
c)



$$m = \frac{1}{4}$$

$$b = -2$$

d)



$$m = -\frac{3}{4}$$

$$b = -2$$

3. Write the equation of each line in question #2

a)  $y = 3x - 2$

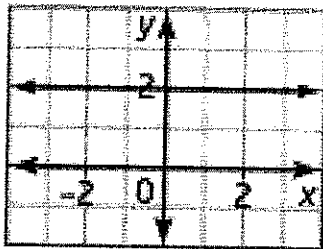
b)  $y = -2x + 3$

c)  $y = \frac{1}{4}x - 2$

d)  $y = -\frac{3}{4}x - 2$

4. Write the equation of each line. State its slope and y-intercept if they exist:

a)

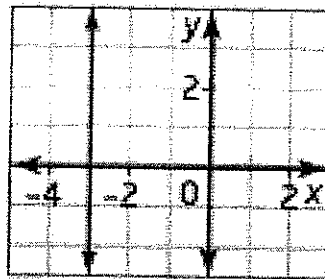


Equation:  $y = 2$

Slope:  $m = 0$

y-intercept:  $b = 2$

b)

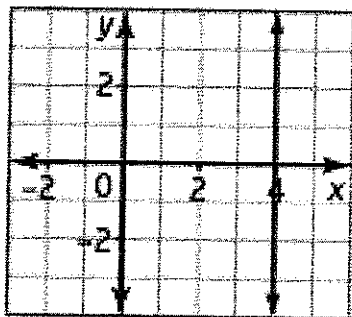


Equation:  $x = -3$

Slope:  $m = \text{undefined}$

y-intercept: none

c)

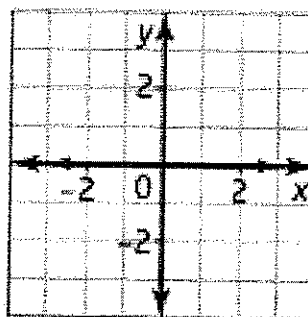


Equation:  $x = 4$

Slope:  $m = \text{undefined}$

y-intercept: none

d)



Equation:  $y = 0$

Slope:  $m = 0$

y-intercept:  $b = 0$

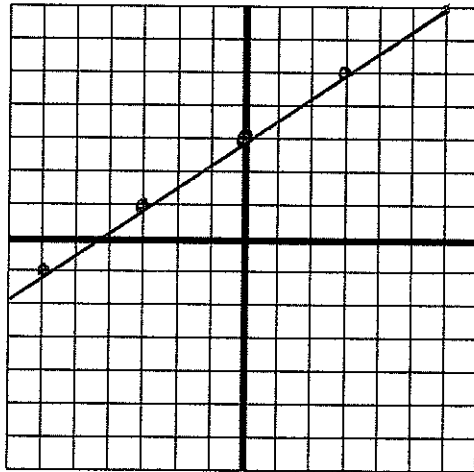
5. The line in question 4 part d) has a special name. What is it?

The  $x$ -axis.

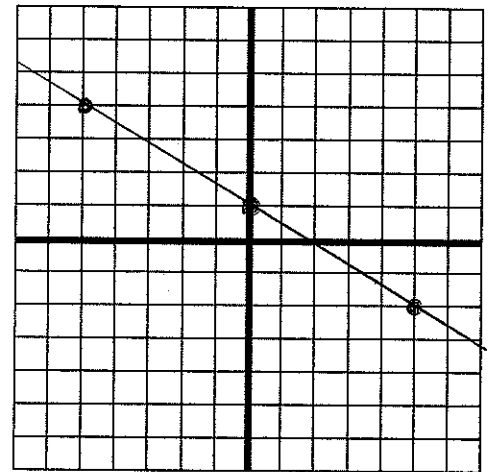
6. The slope and  $y$ -intercept are given. Write the equation and graph each line:

	Slope	$y$ -intercept
a)	$\frac{2}{3}$	3
b)	$-\frac{3}{5}$	1
c)	-2	0
d)	$\frac{4}{3}$	-4
e)	0	-4

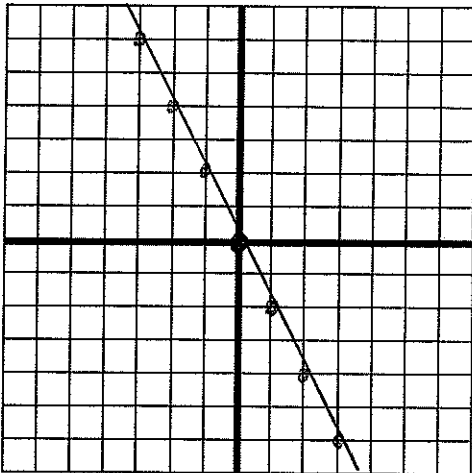
a) Equation:  $y = \frac{2}{3}x + 3$



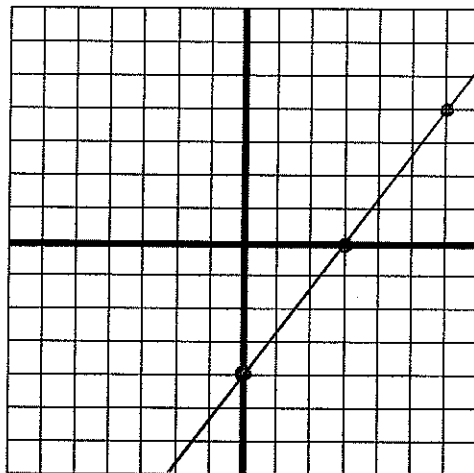
b) Equation:  $y = -\frac{3}{5}x + 1$



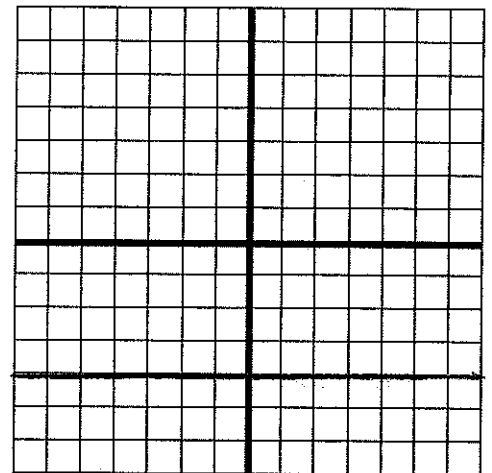
c) Equation:  $y = -2x$



d) Equation:  $y = \frac{4}{3}x - 4$



e) Equation:  $y = -4$

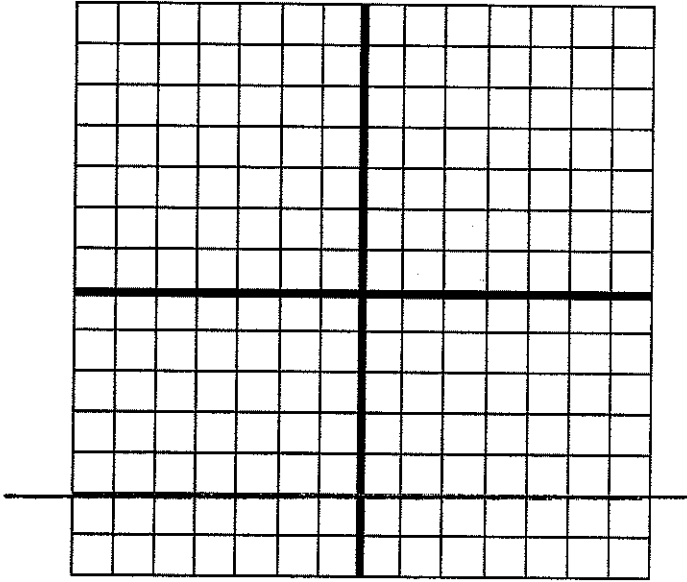


7. State the slope and y-intercept of each line, if they exist. Graph each line.

a)  $y = -5$

slope:  $m = 0$

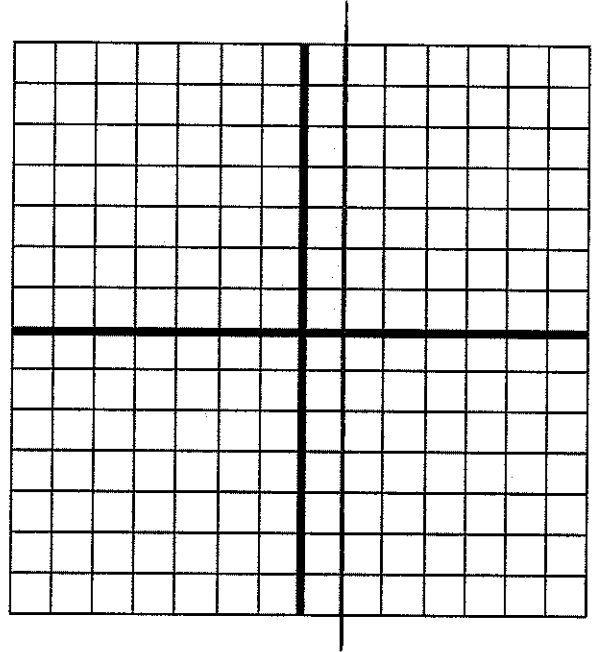
y-intercept:  $b = -5$



b)  $x = 1$

slope: *undefined*

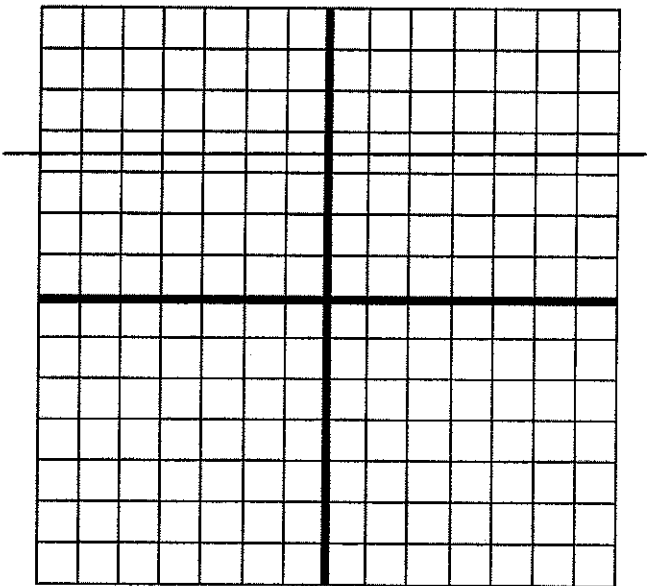
y-intercept: *none*



c)  $y = \frac{7}{2}$

slope:  $m = 0$

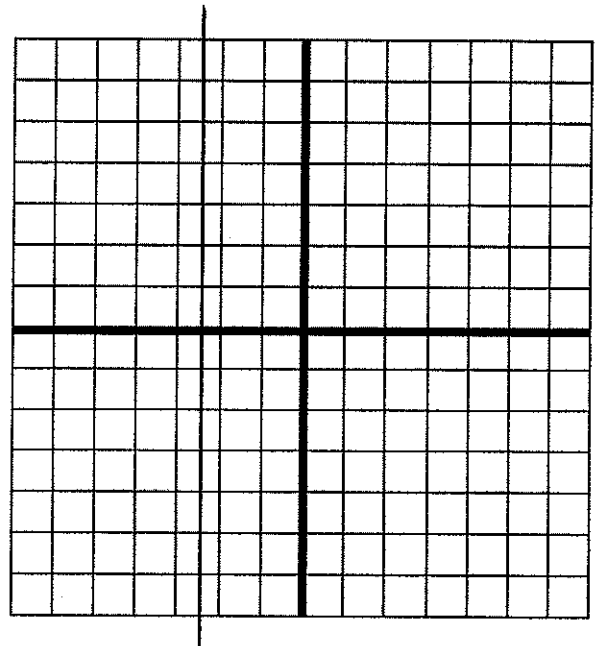
y-intercept:  $b = 3.5$



b)  $x = -2.5$

slope: *undefined*

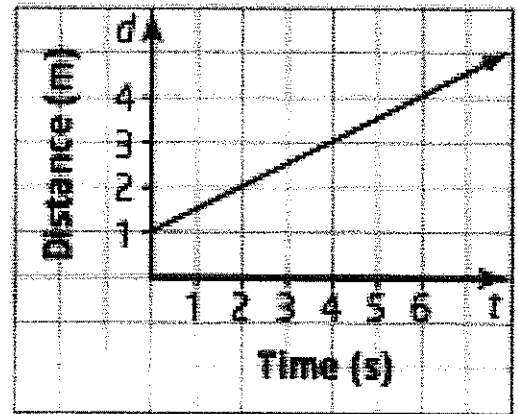
y-intercept: *none*



8. The distance-time graph of a person walking in front to a motion sensor is shown.

a) How far from the sensor did the person begin walking?

$$1\text{m}$$



b) How fast did the person walk? (find the slope)

$$m = \frac{1\text{m}}{2\text{s}}$$

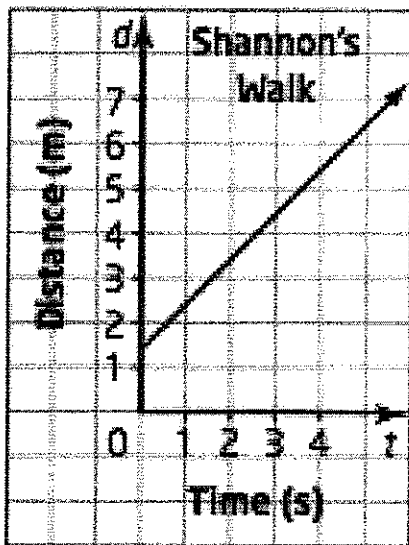
$$= 0.5\text{ m/s}$$

c) Did the person walk away from or toward the sensor? Explain.

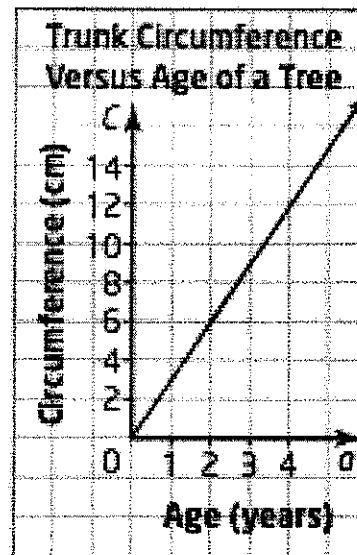
Away

10. Identify the slope and the vertical intercept of each linear relation and explain what they represent. Write an equation to describe the relationship.

a)



b)



Slope:  $m = 1$  (speed)

y-intercept:  $b = 1.5$  (starting distance)

Equation:  $y = x + 1.5$

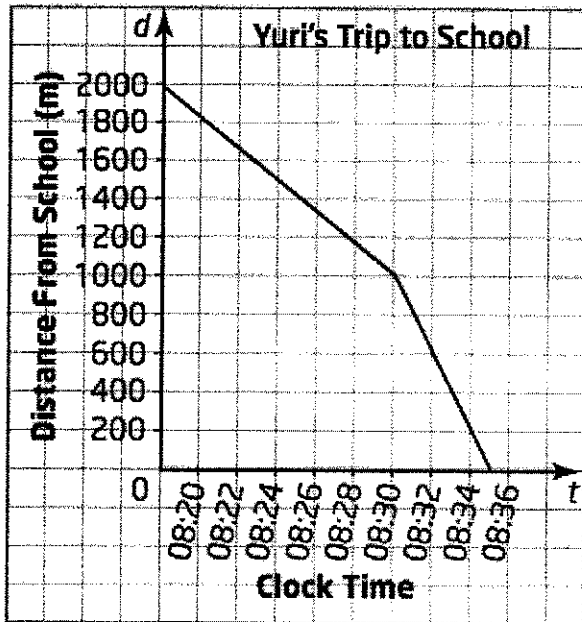
Slope:  $m = \frac{6}{2} = 3$  (rate of increase per year)

y-intercept:  $b = 0$  (starting circumference)

Equation:  $y = 3x$

12.

Yuri tries hard not to be late for class, but sometimes he does not quite make it on time. Class begins at 8:30 A.M. The distance-time graph shows his progress from home to school one morning.



Write a story about Yuri's trip to school. Include the speed, distance, and time in your story.

- Yuri walks to school for ten minutes and travels 1000 m. His walking speed was 100 m/min.
- He then finds a bike and rides it the remaining 1000 m to school in 5 minutes at a speed of 200 m/min.

6.1 The Equation of a Line in Slope-y-Intercept Form:  
 $y = mx + b$ , pages 296-307

	Equation	Slope	y-intercept
a)	$y = 4x + 1$	4	1
b)	$y = \frac{2}{3}x + 3$	$\frac{2}{3}$	3
c)	$y = x - 2$	1	-2
d)	$y = -\frac{2}{3}x$	$-\frac{2}{3}$	0
e)	$y = 3$	0	3
f)	$y = -x - \frac{1}{2}$	-1	$-\frac{1}{2}$

2. a) slope 3; y-intercept -2

b) slope -2; y-intercept 3

c) slope  $\frac{1}{4}$ ; y-intercept -2

d) slope  $-\frac{3}{4}$ ; y-intercept -2

3. a)  $y = 3x - 2$  b)  $y = -2x + 3$

c)  $y = \frac{1}{4}x - 2$  d)  $y = -\frac{3}{4}x - 2$

4. a)  $y = 2$ ; slope 0; y-intercept 2

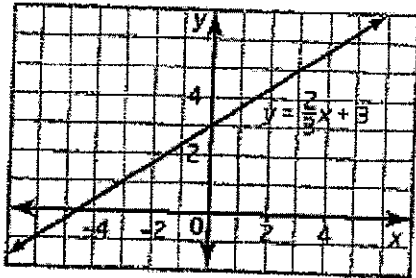
b)  $x = -3$ ; slope undefined; no y-intercept

c)  $x = 4$ ; slope undefined; no y-intercept

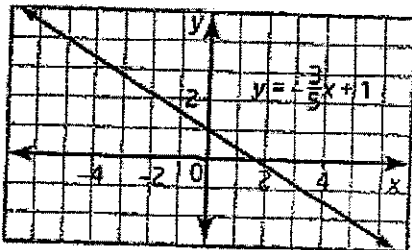
d)  $y = 0$ ; slope 0; y-intercept 0

5. x-axis

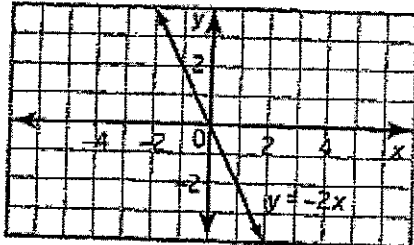
6. a)  $y = \frac{2}{3}x + 3$



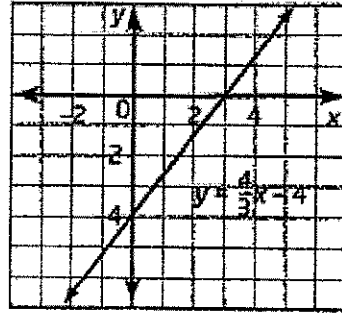
b)  $y = -\frac{3}{5}x + 1$



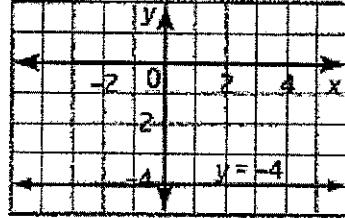
c)  $y = -2x$



d)  $y = \frac{4}{3}x - 4$



e)  $y = -4$

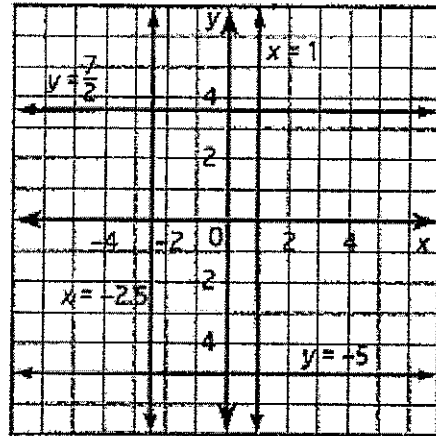


7. a) slope 0; y-intercept -5

b) slope undefined; no y-intercept

c) slope 0; y-intercept  $\frac{7}{2}$

d) slope undefined; no y-intercept



8. a) The person was at an initial distance of 1 m from the sensor.

b) The person was walking at a speed of 0.5 m/s.

c) The person was walking away from the sensor. This is because on the graph, the person's distance from the sensor increases as time goes by.

10. a) slope 1; t-intercept 1.5; The slope represents Shannon's walking speed of 1 m/s away from the sensor. The t-intercept represents Shannon's initial distance of 1.5 m away from the sensor;  $d = t + 1.5$ .

b) slope 3; a-intercept 0; The slope shows that the circumference of the trunk is three times its age. The a-intercept shows that when the tree began to grow from a seed, it had circumference zero.  $C = 3a$ .

12. Answers may vary