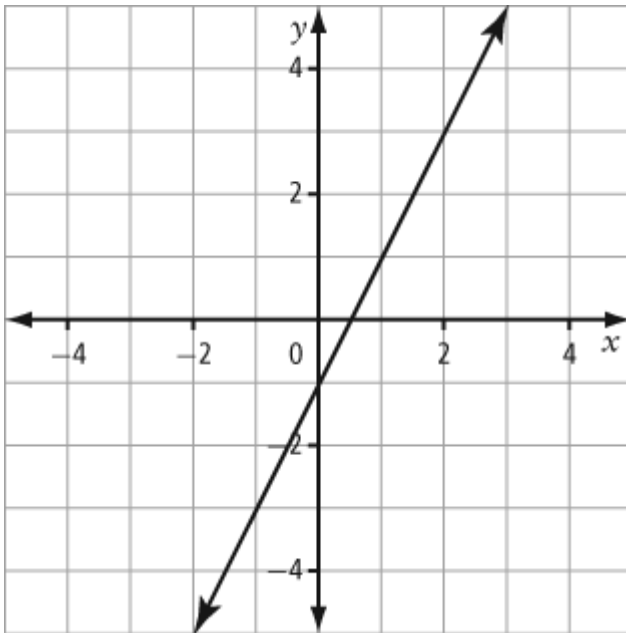


Name: \_\_\_\_\_ T.A. \_\_\_\_\_ Date: \_\_\_\_\_

**1. Expectation #1: Identify the slope and y-intercept of a straight-line graph.**

What are the slope and y-intercept of this line? ( 1 mark)



**2. Expectation #2: Use slope-intercept form to graph, determine a line's equation, and solve problems.**

What is the slope of the line  $y = -4x - 7$  ( 1 mark)

3. Identify the slope and  $y$ -intercept of the relation represented by the equation  $12x - 9y + 2 = 0$ . ( 1 mark)

4. Write the equation  $8x - 4y - 12 = 0$  in slope-intercept form ( 1 mark)

5. **Expectation #3: Convert a linear equation to general form and use it to solve problems.**

Write the equation in general form for the line with slope 3 and  $y$ -intercept  $-4$ . ( 1 mark)

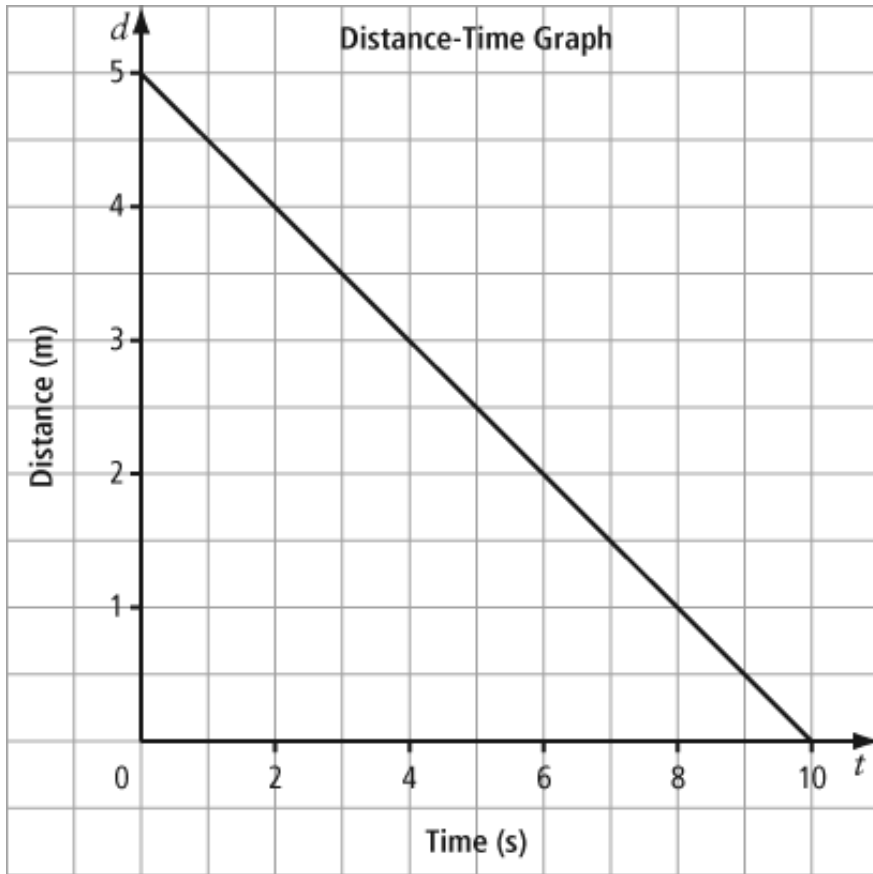
6. **Expectation #4: Use intercepts to graph a line and relate the intercepts to a situation.**

Determine the  $y$ -intercept of the line  $y = 3 - x$ . ( 1 mark)

7. What is the equation of the horizontal line that passes through the point (3, 4)? (1 mark)

8. What is the value of  $p$  in the equation of the line  $px + 2y + 12 = 0$ , such that the  $x$ -intercept is 4? (1 mark)

9. The distance-time graph shows Tracy's distance from a video camera, where  $d$  represents her distance from the camera, in metres, and  $t$  represents time, in seconds. (3 marks)



- a) Identify the  $d$ -intercept on the vertical axis and explain what it means.
- b) Identify the  $t$ -intercept on the horizontal axis and explain what it means.
- c) What is the equation of the line, in general form?

**10. Expectation #5: Use slope-point form to determine a line's equation, and solve problems.**

Determine an equation for the line with slope 4 and passing through the origin. ( 1 mark)

**11.** What is an equation for the line that passes through points (2, 3) and (4, 5)? ( 1 mark)

**12.** Using the table of values, determine the equation of the line. ( 1 mark)

$x$	$y$
-5	-20
0	-5
5	10
10	25
15	40

13. A hockey arena sells game tickets for \$150 each. The hockey team's salaries, arena workers' salaries, and other expenses are fixed at \$45 000 per game, no matter how many tickets are sold. ( 3 marks)

a) Write a linear equation for the total amount of money,  $H$ , earned after expenses if  $t$  tickets are sold for a game.

b) How many tickets have to be sold for a game in order for the arena to earn \$90 000 after expenses?

c) If the team sells 200 tickets for a game, how much money does the arena earn or lose after expenses?

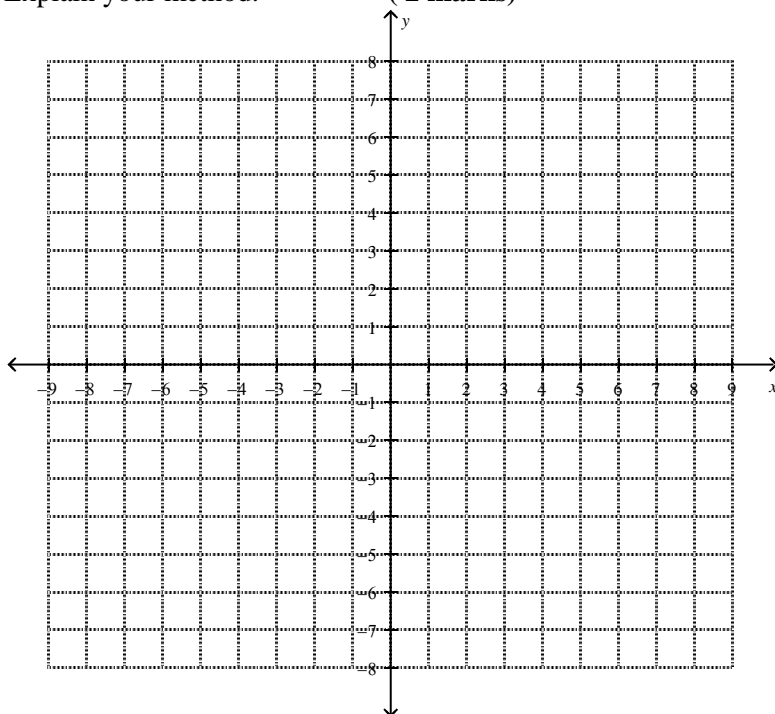
14. **Expectation #6: Identify whether two lines are parallel, perpendicular, or neither.**

The slopes of a pair of lines are provided. Decide whether the lines are parallel, perpendicular, or neither. Justify your answer. ( 1 mark)

$$m = 10 \text{ and } m = -0.1$$

15. What is the slope of a line that is perpendicular to the line passing through points  $G(-3, 8)$  and  $H(0, 5)$ ?  
( 1 mark)

16. The vertices of quadrilateral ABCD are  $A(0, 5)$ ,  $B(9, 2)$ ,  $C(7, -4)$ , and  $D(-2, -1)$ . Is ABCD a rectangle?  
Explain your method. ( 2 marks)



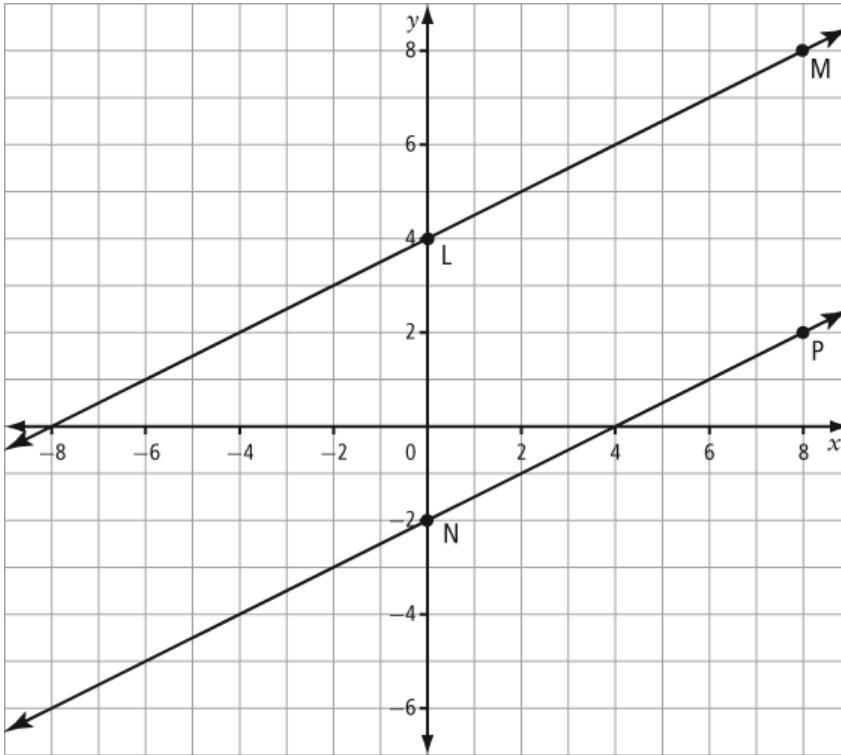
**17. Expectation #7: Write the equation for, and solve problems involving parallel and perpendicular lines.**

What is the equation of the line that is perpendicular to the line  $y = -3x + 2$  and passes through  $(3, -1)$  ?  
( 1 mark)

**18.** State the slope of the line that is parallel to the line  $y = \frac{2}{5}x - 3$  ( 1 mark)

**19.** Write the equation of the line parallel to  $y = 2x - 4$  and with the same  $x$ -intercept as  $3x - 4y = 12$ .  
( 1 mark)

20. In the graph, the equation of the line containing LM is  $y = 0.5x + 4$ . The two lines are parallel. What is the equation of the line containing NP? ( 1 mark)



SHORT ANSWER

1. ANS:

$$y = mx + b$$
$$y = 3x + 2$$

PTS: 1 DIF: A  
TOP: Slope-Intercept Form

OBJ: Section 7.1 NAT: RF7  
KEY: slope-intercept form | equation of a line

2. ANS:

Substitute  $y = 0$  to find the  $x$ -intercept:

$$y = 1 - x$$
$$0 = 1 - x$$
$$x = 1 - x + x$$
$$x = 1$$

The  $x$ -intercept is 1

PTS: 1 DIF: B  
TOP: Slope-Intercept Form

OBJ: Section 7.1 NAT: RF6  
KEY: slope-intercept form | graph |  $x$ -intercept |  $y$ -intercept

3. ANS:

$$x = 3$$

PTS: 1 DIF: A  
TOP: Slope-Intercept Form

OBJ: Section 7.1 NAT: RF7  
KEY: equation of a line | horizontal line | vertical line

4. ANS:

$$\frac{12}{16} = \frac{12 \div 4}{16 \div 4}$$
$$= \frac{3}{4}$$

The lines are parallel because they have the same slope.

PTS: 1 DIF: A  
TOP: Parallel and Perpendicular Lines

OBJ: Section 7.4 NAT: RF3  
KEY: slope | parallel lines | perpendicular lines

5. ANS:

Substitute  $m = 3$  and  $b = 0$  into the slope-intercept form of the equation of a line:

$$y = mx + b$$
$$y = 3x + 0$$
$$y = 3x$$

PTS: 1 DIF: B OBJ: Section 7.1 | Section 7.3  
NAT: RF7 TOP: Slope-Intercept Form | Slope-Point Form  
KEY: equation of a line given the slope and a point | perpendicular lines

6. ANS:

Find the slope:

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{4 - (-2)}{3 - (-1)}$$

$$m = \frac{4 + 2}{3 + 1}$$

$$m = \frac{6}{4}$$

$$m = \frac{3}{2}$$

Substitute  $m = \frac{3}{2}$  and the point  $(-1, -2)$  into  $y = mx + b$ :

$$y = mx + b$$

$$-2 = \frac{3}{2}(-1) + b$$

$$-2 = -\frac{3}{2} + b$$

$$-2 + \frac{3}{2} = -\frac{3}{2} + b + \frac{3}{2}$$

$$-\frac{1}{2} = b$$

The equation of the line is  $y = \frac{3}{2}x - \frac{1}{2}$  or  $y = 1.5x - 0.5$  or  $3x - 2y - 1 = 0$ .

PTS: 1                      DIF: B                      OBJ: Section 7.1 | Section 7.2

NAT: RF7                      TOP: Slope-Intercept Form | General Form

KEY: equation of a line given two points | ordered pairs

7. ANS:

-7

PTS: 1

8. ANS:

slope = 1

y-intercept = 3/2

PTS: 1

9. ANS:

$3x - y - 4 = 0$

PTS: 1

10. ANS:

$p = -2$

PTS: 1

11. ANS:  
 $y = -2x + 7$
- PTS: 1
12. ANS:  
 $y = 3x - 9$
- PTS: 1
13. ANS:  
 $y = 3x - 10$
- PTS: 1
14. ANS:  
slope =  $-\frac{5}{2}$
- PTS: 1
15. ANS:  
 $y = 2x - 8$
- PTS: 1
16. ANS:  
 $y = 0.5x - 2$
- PTS: 1
17. ANS:  
slope =  $m = 2$   
y-intercept =  $b = -1$
- PTS: 1

## PROBLEM

1. ANS:
- a) The slope is  $\frac{3}{2}$  and represents the distance, in metres, Christine walks away from the motion sensor in 1 s.
- b)  $d = mt + b$
- $$d = \frac{3}{2}t + 2$$
- c) Substitute  $d = 6$  into the equation from part b):

$$d = \frac{3}{2}t + 2$$

$$6 = \frac{3}{2}t + 2$$

$$6 - 2 = \frac{3}{2}t + 2 - 2$$

$$4 = \frac{3}{2}t$$

$$2(4) = 2\left(\frac{3}{2}t\right)$$

$$8 = 3t$$

$$\frac{8}{3} = \frac{3t}{3}$$

$$\frac{8}{3} = t$$

$$t \approx 2.7$$

Sarah was 6 m from the sensor after approximately 2.7 s.

PTS: 1                    DIF: B

OBJ: Section 7.1    NAT: RF6 | RF7

TOP: Slope-Intercept Form

KEY: distance-time | graph | slope-intercept form

2. ANS:

Example:

$$\text{Slope of AB} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{2 - 5}{9 - 0}$$

$$m = \frac{-3}{9}$$

$$m = -\frac{1}{3}$$

$$\text{Slope of BC} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{-4 - 2}{7 - 9}$$

$$m = \frac{-6}{-2}$$

$$m = 3$$

$$\text{Slope of CD} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{-1 - (-4)}{-2 - 7}$$

$$m = \frac{-1 + 4}{-9}$$

$$m = \frac{3}{-9}$$

$$m = -\frac{1}{3}$$

$$\text{Slope of DA} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{5 - (-1)}{0 - (-2)}$$

$$m = \frac{5 + 1}{0 + 2}$$

$$m = \frac{6}{2}$$

$$m = 3$$

Because the slopes of AB and CD are equal, AB and CD are parallel.

The slopes of BC and DA are equal, so BC and DA are parallel.

So, quadrilateral ABCD is a parallelogram.

In addition, AB is perpendicular to DA because the product of their slopes is  $\left(-\frac{1}{3}\right) \times (3) = -1$ . Because the adjacent sides are perpendicular, ABCD is a rectangle.

PTS: 1

DIF: D

OBJ: Section 7.4 NAT: RF3

TOP: Parallel and Perpendicular Lines

KEY: parallel lines | perpendicular lines | slope | rectangle

3. ANS:

a)  $C = 0.25t + 2$

b) Substitute  $t = 24$  into the equation  $C = 0.25t + 2$ :

$$C = 0.25t + 2$$

$$C = 0.25(24) + 2$$

$$C = 6 + 2$$

$$C = 8$$

It will cost Danny \$8.00 to park his car for 24 h.

c) Substitute  $C = 6$  into the equation  $C = 0.25t + 2$ :

$$C = 0.25t + 2$$

$$6 = 0.25t + 2$$

$$6 - 2 = 0.25t + 2 - 2$$

$$4 = 0.25t$$

$$\frac{4}{0.25} = \frac{0.25t}{0.25}$$

$$16 = t$$

Danny can park his car for 16 h if he has \$6.00.

PTS: 1                      DIF: B

OBJ: Section 7.1    NAT: RF7

TOP: Slope-Intercept Form

KEY: equation of a line | slope-intercept form | cost