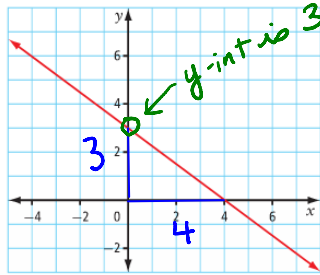


# 7 Practice Test

1. What are the slope and y-intercept of the graph shown?

- A slope:  $-\frac{4}{3}$ , y-intercept: (0, 4)
- B slope:  $-\frac{3}{4}$ , y-intercept: (0, 4)
- C slope:  $-\frac{3}{4}$ , y-intercept: (0, 3)
- D slope:  $-\frac{4}{3}$ , y-intercept: (0, 3)



$m = -3/4$

2. What are the intercepts of the line  $2x - 3y = -6$ ?

- A x-intercept: (3, 0), y-intercept: (0, -2)
- B x-intercept: (-3, 0), y-intercept: (0, 2)
- C x-intercept: (-3, 0), y-intercept: (0, 3)
- D x-intercept: (3, 0), y-intercept: (0, -3)

x-int (y=0)  
 $2x - 3(0) = -6$   
 $2x = -6$   
 $x = -3$   
 (-3, 0)

y-int (x=0)  
 $2(0) - 3y = -6$   
 $-3y = -6$   
 $y = 2$   
 (0, 2)

3. The slope and y-intercept of the line  $7x + 2y - 10 = 0$  are

- A slope:  $\frac{7}{2}$ , y-intercept: (0, 5)
- B slope:  $-\frac{7}{2}$ , y-intercept: (0, 5)
- C slope:  $\frac{7}{2}$ , y-intercept: (0, -5)
- D slope:  $-\frac{7}{2}$ , y-intercept: (0, -5)

$\frac{2y}{2} = \frac{-7x + 10}{2}$   
 $y = -\frac{7}{2}x + 5$   
 $m = -\frac{7}{2}$   
 y-int is (0, 5)

4. The equation  $y = -\frac{3}{4}x + 2$  expressed in general form is

- A  $3x - 4y - 2 = 0$
- B  $3x + 4y - 2 = 0$
- C  $3x + 4y - 8 = 0$
- D  $3x - 4y + 8 = 0$

$y = -\frac{3}{4}x + 2$   
 $4y = 4(-\frac{3}{4}x) + 4(2)$   
 $4y = -3x + 8$   
 $3x + 4y - 8 = 0$

5. A line has a slope of -2 and passes through the point (3, -1). When the equation of the line is written in the form  $y = mx + b$  the value of b is

- A 5
- B 1
- C -1
- D -5

$y + 1 = -2(x - 3)$   
 $y + 1 = -2x + 6$   
 $y = -2x + 5$  (b)

6. Which line is parallel to the line  $2x + 4y - 8 = 0$ ?

- A  $y = \frac{1}{2}x + 5$
- B  $y = \frac{1}{2}x - 1$
- C  $y = -2x + 3$
- D  $y = 2x - 7$

Same slope

Slope is

$\frac{4y}{4} = \frac{-2x + 8}{4}$   
 $y = -\frac{1}{2}x + 2$   
 Slope is  $-\frac{1}{2}$

7. a) If two lines are perpendicular, what is the relationship between their slopes? reciprocals

b) If two lines with slopes of  $\frac{6}{n}$  and  $-\frac{3}{2}$  are perpendicular, what is the value of  $n$ ?

$$\frac{2}{3} = \frac{6}{n}$$

$$n = 9$$

$$\frac{6}{n} \cdot -\frac{3}{2} = -1$$

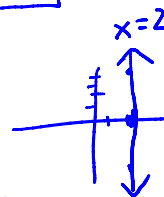
$$\frac{-18}{2n} = \frac{-1}{1}$$

$$-2n = -18$$

$$n = 9$$

8. Express the equation of the line passing through the points (2, 4) and (2, -4) in general form.

$$m = \frac{-4 - 4}{2 - 2} = \text{undefined slope so vertical line} \dots \text{visualize}$$



$$x = 2$$

$$x - 2 = 0 \leftarrow \text{gen form}$$

9. Tickets for a school play were \$10 for adults and \$6 for students. Total ticket sales were \$2900.

a) Write an equation that represents the ticket sales.

b) How many adult tickets were sold if 275 students bought tickets?

$$a) 10A + 6S = 2900$$

$$b) 10A + 6(275) = 2900$$

$$10A + 1650 = 2900$$

$$10A = 1250$$

$$A = 125$$

10. Four equations are listed.

(A)  $y = -3x + 4$   $m = -3, b = 4$

(B)  $y + 10 = -3(x - 2)$

(C)  $6x + 2y - 8 = 0$

(D)  $y + 8 = -3(x - 4)$

Which equations represent the same line? Justify your answers.

(B)  $y + 10 = -3x + 6$   
 $y = -3x - 4$

$$\left. \begin{matrix} m = -3 \\ b = -4 \end{matrix} \right\}$$

← same slope and y-int.

(D)  $y + 8 = -3x + 12$   
 $y = -3x + 4$

$$\left. \begin{matrix} m = -3 \\ b = 4 \end{matrix} \right\}$$

(C)  $6x + 2y - 8 = 0$   
 $\frac{2y}{2} = \frac{-6x + 8}{2}$   
 $y = -3x + 4$

$$\left. \begin{matrix} m = -3 \\ b = 4 \end{matrix} \right\}$$

Therefore A, C and D are the same line

11. Jacob rides his mountain bike at 15 km/h along a 30-km trail. His distance,  $D$ , in kilometres, from the end of the trail at time  $t$  hours may be modelled by the equation  $D = 30 - 15t$ .



rate

a) What does the  $D$ -intercept of a graph of the equation represent?

30 represents the distance left to travel when  $t = 0$

b) Felicia rides at the same speed as Jacob. She starts 2 km behind Jacob on the same trail. Explain why she will never catch up to Jacob. Provide support for your explanation.



at no time will they be at the same pt. on the trail since both lines are parallel (same rate)

12. What is the equation of a line through (3, -1) and parallel to the line  $5x + y - 1 = 0$ ? Express your answer in general form  $Ax + By + C = 0$ . Explain your steps.

$$5x + y - 1 = 0$$

$$y = -5x + 1$$

slope is -5

$$y + 1 = -5(x - 3)$$

$$y + 1 = -5x + 15$$

$$5x + y + 1 - 15 = 0$$

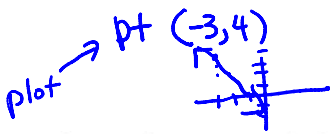
$$5x + y - 14 = 0$$

13. Explain three different strategies you could use to graph the line  $y - 4 = -2(x + 3)$ , without creating a table of values.

① use  $m = -2$  or  $-\frac{2}{1}$

② put into  $y = mx + b$  form

③ use-intercepts  $x$ -int  $y$ -int



$$y - 4 = -2(x - 3)$$

$$y - 4 = -2x + 6$$

$$y = -2x + 10$$

$$(0) - 4 = -2(x + 3)$$

$$-4 = -2x - 6$$

$$2 = -2x$$

$$-1 = x$$

$$y - 4 = -2(0 + 3)$$

$$y - 4 = -6$$

$$y = -2$$

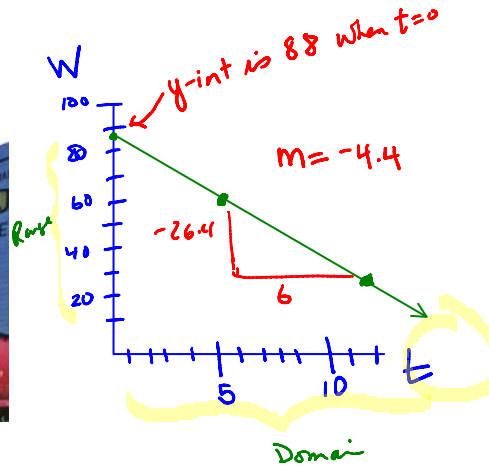
14. When a railway car is unloaded at a grain elevator, the mass of wheat,  $W$ , in tonnes, remaining after  $t$  minutes decreases at a constant rate as shown in the table.

Time, $t$ (min)	Mass of Wheat Remaining, $W$ (tonnes)
0	88.0
6	61.6
12	35.2

$$-26.4$$

$$-26.4$$

- Use the data in the table to sketch a straight-line graph.
- Write the equation of the line in the form  $W = mt + b$ .
- Identify the intercepts. What does each intercept represent?
- What is the slope of the line? What does the slope represent?
- What are the domain and range?
- How long would it take for half of the wheat to be emptied?



c) 88 is W-int. (when  $t=0$ )

$$W = -4.4t + 88$$

$$(0) = -4.4t + 88$$

$$4.4t = 88$$

$$t = 20$$

←  $t$  int is the time it takes for no wheat remaining.

d)  $-4.4$  is the rate of change  $\left(\frac{\Delta W}{\Delta t}\right)$   
loss of wheat per min.

e) Domain:  $0 \leq t \leq 20$   
Range:  $0 \leq W \leq 88$

f)  $W = -4.4t + 88$   
 $(44) = -4.4t + 88$   
 $-44 = -4.4t$   
 $10 = t$

15. The relationship between air temperature and how fast a male cricket chirps is linear. A group of biology students conducted the following experiment. The students counted the number of chirps per minute by a cricket at various locations within the school. In a room where the air temperature was  $14^\circ\text{C}$ , the cricket chirped 70 times per minute. In the cafeteria, the air temperature was  $21^\circ\text{C}$ . The cricket chirped 119 chirps per minute.

- Write a linear equation relating the number of cricket chirps per minute,  $n$ , to the air temperature,  $T$ , in degrees Celsius. Express the equation in slope-intercept form.
- Sketch a graph of the linear equation. Explain your method.
- In the boiler room, the cricket chirped 168 chirps per minute. What is the temperature in the boiler room?

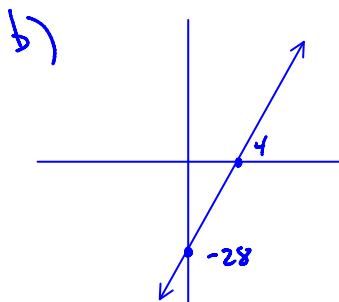
$(T, C)$   
 $(14, 70)$  and  $(21, 119)$

$$m = \frac{\Delta C}{\Delta T} = \frac{119 - 70}{21 - 14} = \frac{49}{7} = 7 \text{ chirps per } 1^\circ\text{C increase}$$

$$C - 70 = 7(T - 14)$$

$$C - 70 = 7T - 98$$

$$C = 7T - 28$$



used intercepts to graph

c)  $C = 7T - 28$   
 $168 = 7T - 28$

$$196 = 11$$
$$28 = T$$

$$28^{\circ}\text{C}$$