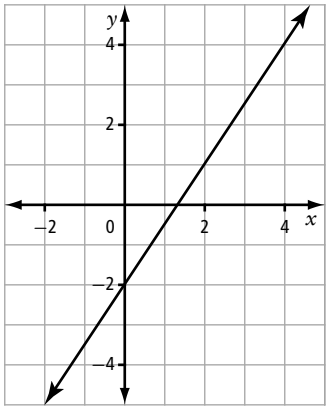
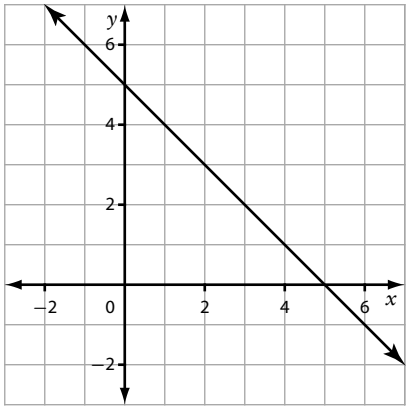
7.1 Slope-Intercept Form

1. For each line, state the slope and y-intercept. Then, write the equation of the line in slope-intercept form.

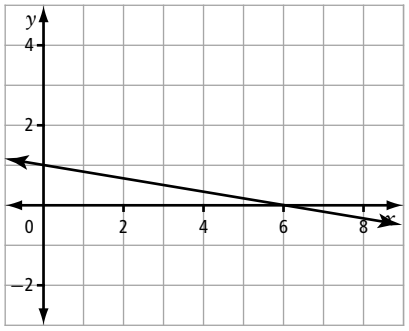
a)



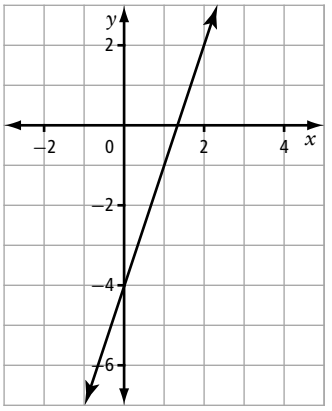
b)



c)



d)



2. The equation of a line is $y = \frac{1}{3}x + b$. What is the value of b if the line passes through the point $(-3, 7)$?

☆3. The equation of a line is $y = mx - 8$. Determine the value of m if the line passes through the point $(-2, 6)$.

4. Mandy's hockey team is trying to raise \$850 to attend a tournament. The team has raised \$500. They plan to raise the remainder of the money by collecting plastic 4-L milk jugs, which they redeem for \$0.25 per jug.

a) Write a linear equation to represent this situation, where y is the money they have raised.

b) Graph the line for the equation in part a).

c) State the slope and y-intercept of the line. What does each of these represent?

d) Determine from the graph how many jugs the team must collect to raise enough money to attend the tournament. Verify your answer algebraically.

7.2 General Form

5. Express each equation in general form.

a) $y = \frac{-1}{2}x - 9$

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

c) $y + 2 = -(x + 1)$

6. Determine the intercepts of each line. Then, graph each line.

a) $2x + y - 4 = 0$

b) $5x - 4y + 20 = 0$

7. Bamboo is the fastest growing plant on Earth. On average, it can grow 60 cm/day, depending on the soil and climatic conditions. Under less than ideal conditions, the growth rate averages 10 cm/day.

a) Write an equation, in general form, that represents the number of days of growth for ideal conditions, x, and the number of days of growth under less than ideal conditions, y, needed for a bamboo plant to reach a height of 42 m.

b) What are the intercepts? What do they represent?

c) What are the domain and range?

d) If it takes 55 days for a bamboo tree to reach 42 m under ideal conditions, how many days would it take to reach this height under less than ideal conditions?

7.3 Slope-Point Form

8. A line has a slope of 2 and passes through the point $(-6, -5)$. Write the equation of the line in slope-point form and in general form.

9. A line has an x-intercept of $\frac{-1}{2}$ and a y-intercept of 4. Write the equation of the line in slope-point form and in general form. Verify your answer using graphing technology.

★10. Robyn is skiing with friends at Marmot Basin in Jasper, Alberta. When he is at the top of Marmot Peak, which has an elevation of 8570 ft, he notes that the temperature is 3 °F. When he skis to the base, where the elevation is approximately 5570 ft, the temperature is 12 °F.

a) Assuming that the temperature change is constant as the altitude changes, write a linear equation in slope-point form showing the relationship between altitude, x, and temperature, y.

b) Use the equation to determine the temperature at the base of Eagle Chair, where the elevation is approximately 6500 ft.

7.4 Parallel and Perpendicular Lines

11. State whether each set of lines is parallel or perpendicular.

a) $6y + 2x - 4 = 0$
$y = 3x + 12$

b) $y = \frac{4}{3}x - 17$
$9y - 12x + 8 = 0$

c) $-9y = 3x - 12$
$12y - 4x = 14$

12. Write the equation of a line, in general form, that runs perpendicular to $2x - y + 8 = 0$ with a y-intercept of 6.

★13. A line runs through $(-1, 3)$ and $(2, 1)$ and has an x-intercept of -4. Write the equation of the line perpendicular at the x-intercept.

14. Explain how the following lines are related.

Line 1: $-2x = 3y$

Line 2: $y = \frac{-2}{3}x - 11$

Line 3: $8x + 12y + 7 = 0$

Line 4: $y - 6 = \frac{-4}{6}(x + 5)$