# Chapter 1 Review

## 1.1 Connect English With Mathematics and Graphing Lines

1. Translate each sentence into an equation. Tell how you are assigning the variables in each.
   **a)** Three consecutive numbers add to 75.
   **b)** Stephane has loonies and toonies in his pocket totalling $25.
   **c)** Three times Jennifer's age is 26 more than Herbert's age.

2. Write a system of equations for each situation.
   **a)** Michael is three times older than his sister Angela. In 1 year, Michael will be twice as old as Angela. How old are the two children today?
   **b)** A $2 raffle ticket offers a bonus $1 early bird draw. 400 tickets were sold for the draw and a total of $894 was collected from ticket sales. How many tickets were bought for $2 and how many were bought for $3?

3. Graph each pair of lines to find their point of intersection.
   **a)** $y = x - 5$
   $y = 3 - x$
   **b)** $y = 3x + 8$
   $x + 2y = 2$
   **c)** $2x - y = -4$
   $2x + y = 6$
   **d)** $3x - 2y = -8$
   $x - 2y = -4$

## 1.2 The Method of Substitution

4. Solve each linear system using the method of substitution.
   **a)** $2x + y = 7$
   $3x - 2y = 21$
   **b)** $y = 2x + 4$
   $x - 4y = -9$
   **c)** $3s + 5t = 2$
   $s + 4t = -4$
   **d)** $3m - 6n = 1$
   $m + 3n = 2$

5. Is the point (3, 5) the solution to each system of linear equations? Explain.
   **a)** $2x - y = 1$
   $3x + 4y = 29$
   **b)** $x + y = 8$
   $2x - y = -1$

6. The two largest deserts in the world are the Sahara Desert and the Australian Desert. The sum of their areas is 13 million square kilometres. The area of the Sahara Desert is 5 million square kilometres more than the area of the Australian Desert. Write and solve a system of equations to find the area of each desert.

## 1.3 Investigate Equivalent Linear Relations and Equivalent Linear Systems

7. Which of the following equations is equivalent to $y = \dfrac{2}{3}x + \dfrac{1}{5}$?
   **A** $y = 2x + 1$
   **B** $3y = 2x + 1$
   **C** $15y = 10x + 3$
   **D** $10x - 15y + 5 = 0$

**8.** A linear system is given.

$$y = \frac{1}{5}x - 3 \qquad ①$$

$$y = -\frac{2}{7}x + 1 \qquad ②$$

**a)** Explain why the following is an equivalent linear system.

$x - 5y = 15 \qquad ③$
$2x + 7y = 7 \qquad ④$

**b)** If you graph all four lines, what result do you expect? Graph to check.

**9.** The two most common place names in Canada are Mount Pleasant and Centreville. The total number of places with these names is 31. The number of places called Centreville is one less than the number of places called Mount Pleasant. Write and solve a system of equations to find the number of places in Canada with each name.

**1.4 The Method of Elimination**

**10.** Solve each linear system. Check each solution.

**a)** $x - y = 14$
   $2x + 5y = -7$
**b)** $2x - 3y = -4$
   $3x + y = 5$
**c)** $3x + 4y = 17$
   $7x - 2y = 17$
**d)** $2x + 5y = 18$
   $3x + 5y - 17 = 0$

**11.** Simplify and solve each system of equations using elimination.

**a)** $2(x - 4) + 3(y + 2) = -8$
   $4(x + 1) + 5(y - 1) = -9$
**b)** $0.4x - 0.1y = 0.6$
   $1.8x + 0.4y = 4.4$

**12.** Cindy buys a large pizza with two toppings for $13.50. Lou buys three large pizzas with four toppings each at the same pizza parlour for $45. Find the cost of a large pizza and the cost per topping.

**1.5 Solve Problems Using Linear Systems**

**13.** A chemist needs 10 L of 21% salt solution. The chemist has two salt solutions available at 15% and 25% salt. Write and solve a linear system to find the volume of each solution that needs to be combined to make the mixture.

**14.** Flying into the wind, a plane takes 6 h to fly 3000 km. On the return flight, with the same wind, the plane takes 5 h to complete the trip. How fast does the plane fly without any wind, and how fast was the wind blowing?

**15.** The public golf course runs a junior league with a registration fee of $200 and a cost of $25 per round played. To stay competitive, the private golf club in the same town offers a junior league with a registration fee of $250, but only $20 per round played.

**a)** Write linear equations to represent both junior leagues.
**b)** Solve the linear system.
**c)** Interpret the solution.
**d)** Which league should each golfer join?
   **i)** MaeLing plans to play 16 rounds in the league.
   **ii)** Jacob plans to play 8 rounds in the league.