

## **Chapter 9 Review**

### **9.1 Solving Systems of Linear Equations by Substitution**

1. a)  $x = -2$  and  $y = 5$     b)  $m = 2$  and  $n = 1$   
c)  $a = 1$  and  $b = 4$     d)  $w = -2$  and  $z = 7$
2. a) no solution  
b) an infinite number of solutions

c) one solution,  $x = -\frac{14}{3}$  and  $y = \frac{16}{3}$

d) one solution,  $x = -3$  and  $y = 3$

3. The length of the bridge in Kobe, Japan, is 1992 m and the length of the Capilano Bridge is 137 m.

4. 60 goals

5. Let  $x$  represent the length of the shorter piece of board. Let  $y$  represent the length of the longer piece.

Write an equation to represent the total length of the board.

$$x + y = 180$$

Write an equation to represent the relationship between the lengths of the two pieces of board.

$$3y = 85 + 4x$$

Isolate  $x$  in the first equation.

$$x + y = 180$$

$$x + y - y = 180 - y$$

$$x = 180 - y$$

Substitute  $180 - y$  for  $x$  in the second equation.

$$3y = 85 + 4x$$

$$3y = 85 + 4(180 - y)$$

$$3y = 85 + 720 - 4y$$

$$3y = 805 - 4y$$

Solve for  $y$ .

$$3y = 805 - 4y$$

$$3y + 4y = 805 - 4y + 4y$$

$$7y = 805$$

$$\frac{7y}{7} = \frac{805}{7}$$

$$y = 115$$

Substitute  $y = 115$  into the first equation and solve for  $x$ .

$$x + y = 180$$

$$x + 115 = 180$$

$$x - 115 - 115 = 180 - 115$$

$$x = 65$$

Therefore, the lengths of the two pieces of board are 115 cm and 65 cm.

6. 864 burgers

## 9.2 Solving Systems of Linear Equations by Elimination

7. a)  $x = 2$  and  $y = -3$

b)  $x = -1$  and  $y = 5$

c)  $x = -\frac{6}{5}$  and  $y = \frac{17}{15}$

d)  $x = -2$  and  $y = 3$

e)  $x = 4$  and  $y = 2$

8. Let  $M$  represent the monthly charge. Let  $T$  represent the text message charge.

Write an equation to represent Wade's January bill.

$$M + 300T = 63$$

Write an equation to represent the total of Wade's bills in February and March.

$$2M + 675T + 12 = 142.50$$

Rewrite the equation in the form

$$ax + by = c.$$

$$2M + 675T + 12 = 142.50$$

$$2M + 675T + 12 - 12 = 142.50 - 12$$

$$2M + 675T = 130.50$$

Eliminate the variable  $M$ . The lowest common multiple of 1 and 2 is 2.

Multiply the first equation by 2.

$$M + 300T = 63$$

$$2(M + 300T) = 2(63)$$

$$2M + 600T = 126$$

Subtract the second equation from the first equation.

$$2M + 600T = 126$$

$$-(2M + 675T = 130.50)$$

$$\hline -75T = -4.50$$

Solve for  $T$ .

$$-75T = -4.50$$

$$\frac{-75T}{-75} = \frac{-4.50}{-75}$$

Substitute  $T = 0.06$  into the first equation and solve for  $M$ .

$$M + 300(0.06) = 63$$

$$M + 18 = 63$$

$$M + 18 - 18 = 63 - 18$$

$$M = 45$$

Therefore, the monthly charge is \$45.00 and the text charge is \$0.06 per message.

9.  $m = -1$  and  $n = 2$

10. a) yes

b) yes

c) no

d) no

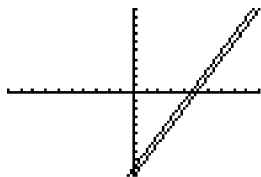
11. \$650 at 10% and \$1450 at 7%

12. 10.75 m by 23.75 m

13. Marmot Basin has 86 runs and Sunshine Village has 107 runs.

### 9.3 Solving Problems Using Systems of Linear Equations

14. a) There is no solution.  
b) The two lines are parallel and do not intersect. Therefore, there is no solution.



15. Michele ran 15 km.
16. Let  $F$  represent the fixed weekly wage. Let  $C$  represent the commission rate.  
Write an equation to represent wages paid for the first week.  
 $F + 15,500C = 1015$   
Write an equation to represent wages paid for the second week.  
 $F + 9800C = 844$   
Isolate  $F$  in the first equation.  
 $F + 15,500C = 1015$   
 $F + 15,500C - 15,500C = 1015 - 15,500C$   
 $F = 1015 - 15,500C$   
Substitute  $F = 1015 - 15,500C$  into the second equation.

$$\begin{aligned} F + 9800C &= 844 \\ 1015 - 15,500C + 9800C &= 844 \\ 1015 - 5700C &= 844 \\ 1015 - 1015 - 5700C &= 844 - 1015 \\ -5700C &= -171 \end{aligned}$$

Solve for  $C$ .

$$\begin{aligned} -5700C &= -171 \\ \frac{-5700C}{-5700} &= \frac{-171}{-5700} \\ C &= 0.03 \end{aligned}$$

Substitute  $C = 0.03$  into the second equation and solve for  $F$ .

$$\begin{aligned} F + 9800C &= 844 \\ F + (9800)(0.03) &= 844 \\ F + 294 &= 844 \\ F + 294 - 294 &= 844 - 294 \\ F &= 550 \end{aligned}$$

Avatar's fixed wage is \$550 and his rate of commission is 3%.

17. 2.5 km  
18. 2.25 mph  
19. \$63.75  
20. 900 kW  
21. 13.5 t