

# Math 10

## Lesson 5-2 Answers

### Lesson Questions

#### Question 1

$$\begin{array}{l} 5x - 3y = 18 \\ -3y = 18 - 5x \end{array} \rightarrow \begin{array}{l} 2x - 3y = 9 \\ 2x + (18 - 5x) = 9 \\ 2x + 18 - 5x = 9 \\ 2x - 5x = 9 - 18 \\ -3x = -9 \\ \frac{-3x}{-3} = \frac{-9}{-3} \\ x = 3 \end{array} \rightarrow \begin{array}{l} 5x - 3y = 18 \\ 5(3) - 3y = 18 \\ 15 - 3y = 18 \\ -3y = 3 \\ y = -1 \end{array}$$

The solution is  $x = 3$  and  $y = -1$

#### Question 2

$$\begin{array}{l} 5n + m = 70 \\ m = 70 - 5n \end{array} \rightarrow \begin{array}{l} 2m = 10 - 2.2n \\ 2(70 - 5n) = 10 - 2.2n \\ 140 - 10n = 10 - 2.2n \\ 140 - 10n + 2.2n = 10 \\ -10n + 2.2n = 10 - 140 \\ -7.8n = -130 \\ n = \frac{-130}{-7.8} \\ n = 16.\bar{6} \end{array} \rightarrow \begin{array}{l} 5n + m = 70 \\ m = 70 - 5n \\ m = 70 - 5(16.\bar{6}) \\ m = 70 - 83.\bar{3} \\ m = 13.\bar{3} \end{array}$$

The solution is  $n = 16.7$  and  $m = 13.3$

#### Question 3

let  $x$  be the amount invested at 3.5%      We have 2 equations       $0.035x + 0.045y = 73$   
let  $y$  be the amount invested at 4.5%       $\longrightarrow$        $x + y = 1800$

$$\begin{array}{l} x + y = 1800 \\ x = 1800 - y \end{array} \rightarrow \begin{array}{l} 0.035x + 0.045y = 73 \\ 0.035(1800 - y) + 0.045y = 73 \\ 0.035 \cdot 1800 - 0.035y + 0.045y = 73 \\ 63 + 0.010y = 73 \\ 0.010y = 10 \\ y = \frac{10}{0.010} \\ \boxed{y = 1000} \end{array} \rightarrow \begin{array}{l} x + y = 1800 \\ x = 1800 - y \\ x = 1800 - 1000 \\ \boxed{x = 800} \end{array}$$

\$800 was invested at 3.5% and \$1000 was invested at 4.5%

### Question 4

let  $x$  be the short piece    We have 2 equations     $y = x + 18$   
 let  $y$  be the long piece     $x + y = 82$

$$\begin{array}{l}
 y = x + 18 \\
 \phantom{y = x + 18} \searrow \\
 x + y = 82 \\
 x + (x + 18) = 82 \\
 2x + 18 = 82 \\
 2x = 64 \\
 x = \frac{64}{2} \\
 \boxed{x = 32}
 \end{array}
 \qquad
 \begin{array}{l}
 y = x + 18 \\
 y = 32 + 18 \\
 \boxed{y = 50}
 \end{array}$$

The lengths of the pieces are 32 and 50.

### Assignment

1. a)  $x = 16, y = -7$     b)  $x = 6, y = 7$     c)  $x = -1, y = -8$     d)  $x = 1, y = 4$

2. a)  $x = -2, y = 5$     b)  $x = -2, y = 3$     c)  $x = 3, y = 5$     d)  $x = 1, y = 4$

3. Variables may differ.

$$2l + 2w = 540 \text{ and } l - w = 90$$

Length: 180 cm; width: 90 cm

4. Variables may differ.

$$s + a = 45 \text{ and } 0.8s + 0.6a = 31$$

20 students and 25 adults

5. Variables may differ.

$$x + y = 11 \text{ and } 4x + 5y = 47$$

8 groups of 4 and 3 groups of 5

6. Variables may differ.

$$p + a = 85 \text{ and } 0.6p + 0.4a = 38$$

20 people masks; 65 animal masks

7. Variables may differ.

$$0.80A + 0.92B = 63 \text{ and } A + B = 75$$

Part A: 50 marks; part B: 25 marks

8. Variables may differ.

$$x + y = 5000 \text{ and } 0.025x + 0.0375y = 162.50$$

Two thousand dollars in the 2.5% bond; \$3000 in the 3.75% bond

9. Variables may differ.

$$76s + 49d = 474.25 \text{ and } 54s + 37d = 346.25$$

Single-scoop cone: \$3.50; double-scoop cone: \$4.25



10. Joel would have to work 15 weekends before he earns the same amount as Sue.
11. a) 16 km/h  
b) 40 km
12. Rate of climb: 200 m/min; rate of descent:  $-200$  m/min
13. Some advantages of solving a linear system using the substitution strategy rather than graphing:  
a. Easy to do.  
b. Yields exact values.

