Math 10

Lesson 5-3 Answers

Lesson Questions

Question 1

$$\begin{array}{l} 3\times(2x+7y=24) \\ 2\times(3x-2y=-4) \end{array} \longrightarrow \begin{array}{r} 6x+21y=72 \\ -(6x-4y=-8) \\ \hline 25y=80 \end{array}$$

$$y=\frac{80}{25}$$

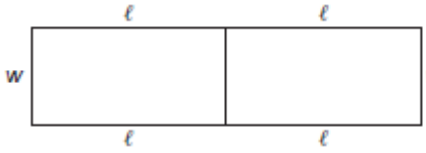
$$y=\frac{16}{5}$$

$$\begin{aligned} 3x-2y&=-4 \\ 3x-2\left(\frac{16}{5}\right)&=-4 \\ 3x-\frac{2(16)}{5}&=-4 \\ 15x-32&=-20 \\ 15x&=12 \\ x&=\frac{12}{15} \\ x&=\frac{4}{5} \end{aligned}$$

The solution is $x=\frac{4}{5}$ and $y=\frac{16}{5}$.

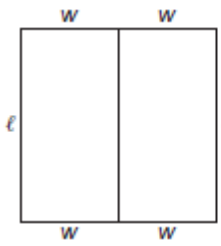
Question 2

A carpenter placed two identical plywood sheets end to end and measured their perimeter.



Perimeter: 40 ft. $2w+4\ell=40$

The carpenter placed the sheets side to side and measured their perimeter.



Perimeter: 32 ft. $4w+2\ell=32$

Determine the dimensions of a piece of this plywood.

$$\begin{array}{l} 2\times(2w+4\ell=40) \\ 4w+2\ell=32 \end{array} \longrightarrow \begin{array}{r} 4w+8\ell=80 \\ -(4w+2\ell=32) \\ \hline 6\ell=48 \end{array}$$

$$\ell=\frac{48}{6}$$

$$\ell=8$$

$$\begin{aligned} 2w+4\ell&=40 \\ 2w+4(8)&=40 \\ 2w+32&=40 \\ 2w&=8 \\ w&=4 \end{aligned}$$

The length of a sheet of plywood is 8 ft and the width is 4 ft.

Question 3

Let x by the mass of 50% alloy and y be the mass of 25% alloy.

For the total mass

$x+y=625$

For the mass of silver

$0.50x+0.25y=0.40(625)$

$0.50x+0.25y=250$

$$\begin{aligned} &x+y=625 \\ &2\times(0.50x+0.25y=250) \end{aligned} \longrightarrow \begin{aligned} &x+y=625 \\ &-(x+0.50y=500) \\ &0.50y=125 \\ &y=\frac{125}{0.50} \\ &y=250 \end{aligned} \longrightarrow \begin{aligned} &x+y=625 \\ &x+250=625 \\ &x=375 \end{aligned}$$

She should use 375 g of the 50% alloy and 250 g of the 25% alloy.

Question 4

$$\begin{aligned} &3\times(3x+9y=5) \\ &9x-6y=-7 \end{aligned} \longrightarrow \begin{aligned} &9x+27y=15 \\ &-(9x-6y=-7) \\ &33y=22 \\ &y=\frac{22}{33} \\ &y=\frac{2}{3} \end{aligned} \longrightarrow \begin{aligned} &9x-6y=-7 \\ &9x-\frac{6(2)}{3}=-7 \\ &9x-4=-7 \\ &9x=-3 \\ &x=\frac{-3}{9} \\ &x=-\frac{1}{3} \end{aligned}$$

The solution is $x=-\frac{1}{3}$ and $y=\frac{2}{3}$.

Question 5

$$\begin{aligned} &4\times\left(\frac{3}{4}x-y=2\right) \\ &16\times\left(\frac{1}{8}x+\frac{1}{4}y=2\right) \end{aligned} \longrightarrow \begin{aligned} &3x-4y=8 \\ &+(2x+4y=32) \\ &5x\quad\ =40 \\ &x=\frac{40}{5} \\ &x=8 \end{aligned} \longrightarrow \begin{aligned} &\frac{3}{4}x-y=2 \\ &\frac{3(8)}{4}-y=2 \\ &6-y=2 \\ &-y=-4 \\ &y=4 \end{aligned}$$

The solution is $x = 8$ and $y = 4$.

Assignment

1. a) $x = -4, y = 3$ b) $m = -\frac{2}{3}, n = -\frac{1}{3}$
   c) $s = 0, t = 2$ d) $a = 3, b = -2$

2. a) $x = \frac{79}{7}, y = \frac{122}{7}$ b) $a = -3, b = -7$
   c) $a = \frac{1}{2}, b = \frac{1}{3}$ d) $x = \frac{5}{2}, y = -3$

3. $x + y = 90\,530$ and $y - x = 120$
   2006 attendance: 45 205; 2008 attendance: 45 325

4. $10k + 20b = 200$ and $15k + 25b = 270$
   1 knife: 8 beaver pelts; 1 blanket: 6 beaver pelts

5. $4.5m + 0.5f = 620$ and $f - m = 40$
   Moderate tempo: 120 beats/min; fast tempo: 160 beats/min
6. 36 girls; 40 boys

7. An adult pays $6.75 and a child pays $7. So, a child's ticket is more expensive.

8. 15 kg of green peas; 10 kg of red lentils

9. 40 bushels/acre for wheat; 58 bushels/acre for barley