Math 10

Lesson 5-4 Answers

Assignment

1.

a)

i) 1
ii) –1
iii) 1
iv) –1

b) i and iii, and ii and iv are parallel

c) i intersects with ii and iv, iii intersects with ii and iv

2.

a) A and C or B and C have one solution since they intersect.

b) Since A and B are parallel, they would have no solutions.

3.

a)
$$\begin{array}{r} x+2y=6 \\ -\left(\underline{x+y=-2}\right) \\ y=8 \end{array}$$

$$\begin{aligned} x+2y&=6 \\ x+2(8)&=6 \\ x+16&=6 \\ x&=-10 \end{aligned}$$

The solution is $x = -10$ and $y = 8$.

b)
$$\begin{array}{l} 2\times\left(3x+5y=9\right) \\ 6x+10y=18 \end{array} \rightarrow \begin{array}{r} 6x+10y=18 \\ -\left(\underline{6x+10y=18}\right) \\ 0=0 \end{array}$$

The lines are coincident, therefore there are an infinite number of solutions.

c)
$$\begin{array}{l} 2\times\left(2x-5y=30\right) \\ 4x-10y=15 \end{array} \rightarrow \begin{array}{r} 4x-10y=60 \\ -\left(\underline{4x-10y=15}\right) \\ 0=45 \end{array}$$

The lines are parallel, therefore no solutions are possible.

d)
$$\begin{array}{l} 2\times\left(2x+3y=4\right) \\ 4x+6y=7 \end{array} \qquad \begin{array}{r} 4x+6y=8 \\ -\left(\underline{4x+6y=7}\right) \\ 0=1 \end{array}$$

The lines are parallel, therefore no solutions are possible.

4. Let x be the number of wins and y be the number of losses.

$2x + y = 107$ → $2x + y = 107$

$x = y + 43$ → $2(y + 43) + y = 107$

$2y + 86 + y = 107$

$3y = 107 - 86$

$3y = 21$

$y = 7$ → $x = y + 43$

$x = 7 + 43$

$x = 50$

The number of overtime wins was 50 and the number of overtime losses was 7.

5.

$x = y - 3$ → $2x + 2y + 17 = 58$

$2x + 2y = 41$

$2(y - 3) + 2y = 41$

$2y - 6 + 2y = 41$

$4y = 47$

$y = \frac{47}{4}$

$y = 11.75$ → $x = y - 3$

$x = 11.75 - 3$

$x = 8.75$

The values of x and y are 8.75 and 11.75 respectively.

6. Nadine has a cup of nickels and a cup of dimes. The total number of coins is 300 and their value is \$23.25. How many coins are in each cup?

Let n be the number of nickels and d be the number of dimes.

$n + d = 300$ $\quad .05n + .10d = 23.25$ $\quad n = 300 - d$

$n = 300 - d$ → $.05(300 - d) + .10d = 23.25$ $\quad n = 300 - 165$

$15 - .05d + .10d = 23.25$ $\quad n = 135$

$.05d = 8.25$

$d = 165$ → $n = 300 - d$

There are 165 dimes and 135 nickels.

7. Let S be the money in savings and C be the money in chequing.

$S + C = 85$ $\quad 2S + 2C = 170$

$S = 85 - C$ $\quad 2(85 - C) + 2C = 170$

$170 - 2C + 2C = 170$

$0 = 0$

From the information given it is not possible to determine the amount in each account.

8. Let x be the number of people on Saturday and y the number of people on Sunday.

$x + y = 568$ $\quad$ $x + 44 = y$ $\quad$ $x = 568 - y$

$x = 568 - y$ $\quad$ $568 - y + 44 = y$ $\quad$ $x = 568 - 262$

$524 = y + y$ $\quad$ $x = 306$

$524 = 2y$

$262 = y$

The attendance for Saturday was 306 and for Sunday was 262.

9. Let x be the mass of the large container and y be the mass of the small container.

$2x + y = 3$

$y = 3 - 2x$ $\quad$ $6x + 3y = 9$

$6x + 3(3 - 2x) = 9$

$6x + 9 - 6x = 9$

$0 = 0$

From the information given it is not possible to determine the mass of each container.

10. Let a be the number of adults and s the number of students.

$a + s = 75$ $\quad$ $5a + 3s = 275$

$a = 75 - s$ $\quad$ $5(75 - s) + 3s = 275$

$375 - 5s + 3s = 275$ $\quad$ $a = 75 - s$

$-2s = -100$ $\quad$ $a = 75 - 50$

$s = 50$ $\quad$ $a = 25$

There were 25 adults and 50 students.