

Student: _____
Date: _____

Instructor: Andreas Lazari
Course: Math1111-Summer2018

Assignment: Section 5.1 Homework

1. Determine whether the given ordered pair is a solution of the system.

$(5, -7)$
 $y = 3x - 22$
 $7x + 6y = -7$

$-7 = 3(5) - 22 \Rightarrow -7 = 15 - 22 \Rightarrow -7 = -7.$
 $7(5) + 6(-7) = -7 \Rightarrow 35 - 42 = -7 \Rightarrow -7 = -7.$

Is $(5, -7)$ a solution of the system?

- Yes
 No

2. Solve the system by the substitution method.

$x + 2y = -2$
 $y = -3x - 21$

$x + 2(-3x - 21) = -2 \Rightarrow x - 6x - 42 = -2 \Rightarrow -5x = 40 \Rightarrow x = -8$
 $y = -3(-8) - 21 = 24 - 21 = 3$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is $\{(-8, 3)\}$. (Type an ordered pair.)
 B. There are infinitely many solutions.
 C. There is no solution.

3. Solve the system by the substitution method.

$7x + 8y = -41$
 $4x - y = 10$

$\Rightarrow 7x + 8(4x - 10) = -41 \Rightarrow 7x + 32x - 80 = -41$
 $39x = 39 \Rightarrow x = 1$

$\Rightarrow y = 4x - 10$ for $x = 1$; $y = 4(1) - 10 = -6$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is $\{(1, -6)\}$. (Type an ordered pair.)
 B. There are infinitely many solutions.
 C. There is no solution.

4. Solve the system by the addition method.

$x + 5y = 3 \Rightarrow -5x - 25y = -15$
 $5x + 4y = -6$

$x + 5(0) = 3$
 $x = 3 - 5 = -2$
 $x = -2$

Select the correct choice below and fill in any answer boxes present in your choice.

- A. The solution set is $\{(-2, 1)\}$. (Simplify your answer. Type an ordered pair.)
 B. There are infinitely many solutions.
 C. There is no solution.

5. Solve the system by the addition method.

$$\begin{aligned} 3x - 2y &= 6 \Rightarrow 5(3x - 2y) = 5(6) \Rightarrow 15x - 10y = 30 \\ 4x + 5y &= 8 \Rightarrow 2(4x + 5y) = 2(8) \Rightarrow 8x + 10y = 16 \end{aligned}$$

$$\begin{aligned} 15x - 10y &= 30 \\ 8x + 10y &= 16 \\ \hline 23x + 0 &= 46 \Rightarrow x = \frac{46}{23} = 2 \end{aligned}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is $\{(2, 0)\}$. (Type an ordered pair.)
 B. There are infinitely many solutions.
 C. There is no solution.

For y: $4(2) + 5y = 8$
 $8 + 5y = 8$
 $5y = 0$
 $\Rightarrow y = 0$

6. Solve the system by the method of your choice.

$$\begin{aligned} 4x = y - 5 \Rightarrow 4x - y &= -5 \Rightarrow -4x + y = 5 \\ 4x - y &= 6 \end{aligned}$$

$$\begin{aligned} -4x + y &= 5 \\ 4x - y &= 6 \\ \hline 0 - 0 &= 11 \Rightarrow 0 = 11 \end{aligned}$$

No solution.

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is $\{\quad\}$. (Type an ordered pair.)
 B. There are infinitely many solutions.
 C. There is no solution.

7. Solve by the method of your choice.

$$\begin{aligned} -5(3x + 9y &= 9) \Rightarrow -15x - 45y = -45 \\ 3(5x + 15y &= 15) \Rightarrow 15x + 45y = 45 \end{aligned}$$

$$\begin{aligned} -15x - 45y &= -45 \\ 15x + 45y &= 45 \\ \hline 0 &= 0 \end{aligned}$$

$0 = 0$; There are infinitely solutions.

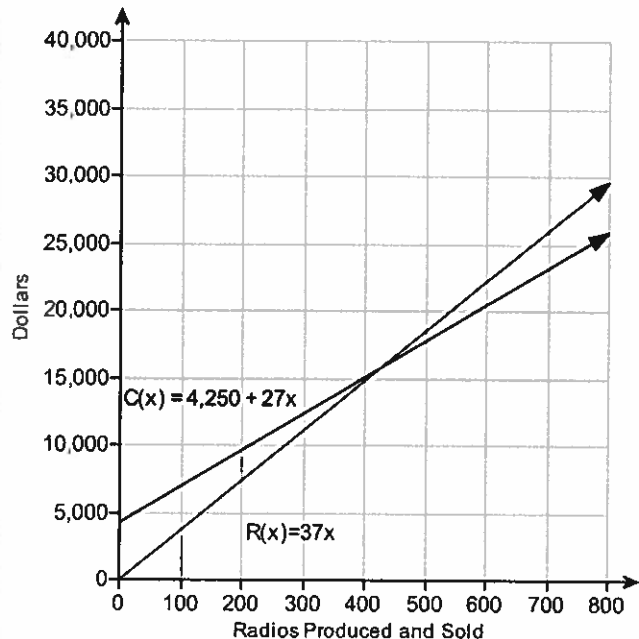
Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is $\{\quad\}$. (Type an ordered pair.)
 B. There are infinitely many solutions.
 C. There is no solution.

8. The figure on the right shows the graphs of the cost and revenue functions for a company that manufactures and sells small radios. How many radios must be produced and sold for the company to break even?

The number of radios that must be produced and sold in order to break even is 425 radios.

$$\begin{aligned} 37x &= 4250 + 27x \\ 10x &= 4250 \\ \Rightarrow x &= \frac{4250}{10} = 425 \end{aligned}$$



9. The figure shows the graphs of the cost and revenue functions of a company that manufactures and sells small radios. Use the formulas below to find $R(100) - C(100)$. Describe what it means for the company.

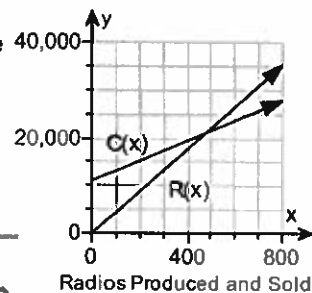
$$R(x) = 44x$$

$$C(x) = 11,000 + 21x$$

$$R(100) = 44(100) = 4400$$

$$C(100) = 11000 + 21(100) = 11000 + 2100 = 13100$$

$$R(100) - C(100) = 4400 - 13100 = -8,700$$



What is the value of $R(100) - C(100)$?

$$R(100) - C(100) = \$ \underline{-8,700}$$

Which of the following statements best describes what this means for the company?

- A. The company is making money because revenue is greater than cost.
- B. The company is losing money because revenue is greater than cost.
- C. The company is making money because cost is greater than revenue.
- D. The company is breaking even because cost and revenue are equal.
- E. The company is losing money because cost is greater than revenue.

10. Some election data can be modeled by the following system of equations

$$x + 2y = 51$$

$$-x + 2y = 23$$

$$\begin{array}{r} x + 2y = 51 \\ -x + 2y = 23 \\ \hline 0 + 4y = 74 \\ 4y = 74 \\ y = \frac{74}{4} = 18.5 \text{ percent} \end{array}$$

where x is years after 1996, and y is the percentage of group A voters in the first equation, and y is the percentage of group B voters in the second equation. Use the addition method to determine in which year the percentage of voters from group A will be the same as the percentage of voters from group B. For that year, what percent will be from group A and what percent will be from group B?

$$x + 2(18.5) = 51 \Rightarrow x = 51 - 37 = 14 \text{ years}$$

In which year will the percentage of voters from group A be the same as the percentage of voters from group B?

2010
(Type a whole number.)

14 years from 1996 is year 2010.

What percent will be from group A and what percent will be from group B that year?

18.5%
(Type an integer or a decimal.)

11. A 6000-seat theater has tickets for sale at \$27 and \$40. How many tickets should be sold at each price for a sellout performance to generate a total revenue of \$193,200?

The number of tickets for sale at \$27 should be 3600.

$$x + y = 6000$$

The number of tickets for sale at \$40 should be 2400.

$$27x + 40y = 193200$$

$$x = 6000 - y \Rightarrow 27(6000 - y) + 40y = 193200$$

$$\Rightarrow 162000 - 27y + 40y = 193200$$

$$\Rightarrow 13y = 31200 \Rightarrow y = \underline{2400}$$

$$x = 6000 - 2400 = \underline{3600}$$

1. Yes

2. A. The solution set is $\{ (-8, 3) \}$. (Type an ordered pair.)

3. A. The solution set is $\{ (1, -6) \}$. (Type an ordered pair.)

4. A. The solution set is $\{ (-2, 1) \}$. (Simplify your answer. Type an ordered pair.)

5. A. The solution set is $\{ (2, 0) \}$. (Type an ordered pair.)

6. C. There is no solution.

7. B. There are infinitely many solutions.

8. 425

9. -8,700

E. The company is losing money because cost is greater than revenue.

10. 2010

18.5

11. 3600

2400
