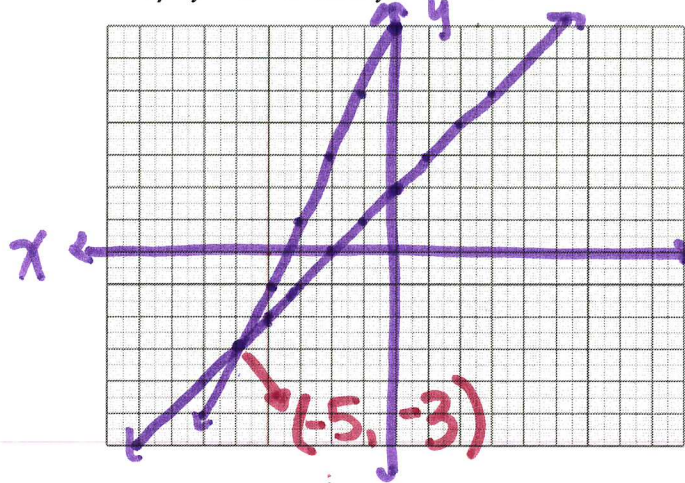
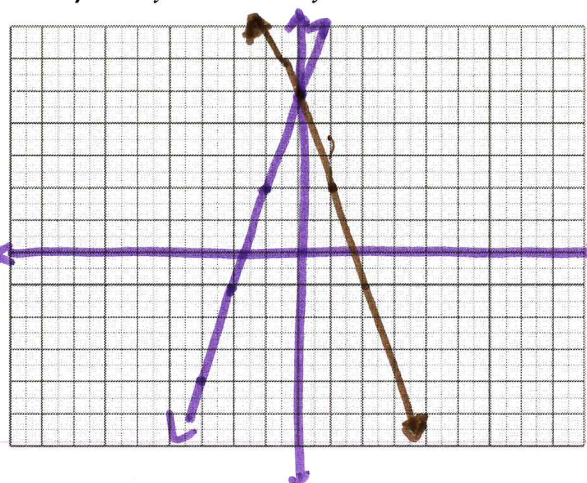


Determine how many solutions does each systems have by graphing. Please provide the solution if it has a definite answer. (6 pts each)

1) $y = x + 2$ and $y = 2x + 7$



2) $3x + y = 5$ and $2y - 10 = -6x$



ALL ~~Solutions~~
Solution

Given 6 problems; solve 3 using substitution and 3 with elimination. State which one you use on each problem. (4pts each)

3) elimination

$$\begin{array}{r} 2x + 5y = 16 \quad | \quad 5 \\ 5x - 2y = 11 \quad | \quad 2 \\ \hline 10x + 25y = 80 \\ -(10x - 4y = 22) \\ \hline 29y = 58 \\ \frac{29y}{29} = \frac{58}{29} \\ y = 2 \end{array}$$

$2x + 5(2) = 16$
 $2x = 6$
 $x = 3$

$(3, 2)$

5) sub
 $y = 7 - x$
 $x - y = -3$

$x - (7 - x) = -3$
 $2x - 7 = -3$
 $2x = 4$
 $x = 2$

$y = 5$ $(2, 5)$

Substitution
 4) $2x + y = -4 \Rightarrow y = -2x - 4$
 $5x + 3y = -6$

$5x + 3(-2x - 4) = -6$
 $5x - 6x - 12 = -6$
 $-x = +6$
 $x = -6$

$y = -2(-6) - 4 = +12$

$(-6, 12)$ ~~(-6, 12)~~ ~~(-6, 12)~~

6) $5x - 3y = 12$
 $+ (-2x + 3y = -3)$

$3x = 9$
 $x = 3$

$5(3) - 3y = 12$ $(3, 1)$
 $15 - 3y = 12$
 $-15 \quad +15$
 $-3y = -3$
 $y = 1$

12

13

14

15

16

17

7) $x = 2y - 7$
 $y - 3x = -9$

substitution

$$= 2(6) - 7 = 5$$

$$y - 3(2y - 7) = -9$$

$$y - 6y + 21 = -9$$

$$-5y + 21 = -9$$

$$-5y = -30$$

$$y = 6$$

(5, 6)

8) $x - 2y = 5$
 $3x - 5y = 8$

elimination
~~substitution~~

$$\begin{array}{r} 3x - 6y = 15 \\ -(3x - 5y = 8) \\ \hline -y = 7 \\ y = -7 \end{array}$$

$$x - 2(-7) = 5$$

$$x + 14 = 5$$

$$x = -9$$

(-9, -7)

9) The perimeter of a rectangular garden is 68 feet. The length of the garden is 4 more than twice the width. Write a systems of equations that will determine the length l and the width w of the garden? And solve for the length and the width of this garden using your choice of method. (7pts)

$$l = 4 + 2w$$

$$P = 2l + 2w = 68 \Rightarrow 2(4 + 2w) + 2w = 68$$

$$l = 4 + 2w$$

$$= 24 + 4$$

$$8 + 4w + 2w = 68$$

$$6w = 60$$

$$w = 10 \text{ ft}$$

10) The manager of a movie theater found that Saturday's sales were \$3675. He knew that a total of 650 tickets were sold Saturday. Adult tickets cost \$7.50, and children's tickets cost \$4.50. Write a system of equations that represent the number of tickets sold and the amount of money collected. Then determine how many of each kind of ticket were sold. (Justify/explain your answer) (7pts)

$$\begin{array}{r} 7.50a + 4.50c = 3675 \\ 4.50(a + c) = 650 \Rightarrow -(4.50a + 4.50c = 2925) \\ \hline 3a = 750 \\ a = 250 \text{ tickets} \\ \text{adult} \end{array}$$

$C = 400$ tickets
 children

~~$a = 100$~~ ~~$c = 550$~~

11) You can work at most 20 hours next week. You need to earn at least \$92 to cover your weekly expenses. Your dog-walking job pays \$7.50 per hour and your job as a car wash attendant pays \$6 per hour.

- Write a system of linear inequalities to model the situation.
- Give two points of possible solution.
- Would you have enough money if you work at both jobs for 10 hours each. Why or why not?

$$a. \begin{cases} d + a \leq 20 \\ 7.50d + 6a \geq 92 \end{cases} \Rightarrow \begin{cases} 6d + 6a \leq 120 \\ 7.50d + 6a \geq 92 \end{cases}$$

$d =$ amt of hrs dog walking
 $a =$ amt of hrs for car washing

12) Marsha is buying plants and soil for her garden. The soil cost \$4 per bag, and the plants cost \$10 each. She wants to buy at least 5 plants and can spend no more than \$100. Write a system of linear inequalities to model the situation. Write two possible points of solution.

$x =$ # of soil $y =$ # of plants

$$y \geq 5$$

$$\begin{aligned} 4x + 10y &\leq 100 \\ -4x &\quad -4x \\ \hline 10y &\leq -4x + 100 \\ \frac{10y}{10} &\leq \frac{-4x}{10} + \frac{100}{10} \end{aligned}$$

$$y \leq \frac{-2x}{5} + 10$$

13) During a family trip, you share the driving with your dad. At most, you are allowed to drive for 3 hours. While driving, your maximum speed is 55 miles per hour.

- Write a system of inequalities describing the possible numbers of hours t and distance d you may have to drive.

$$t \leq 3$$

$$r = 55 \text{ mph}$$

$$\frac{d}{t} = 55$$

$$d = rt$$

$$r = \frac{d}{t}$$

- Is it possible for you to have driven 160 miles?

$$\frac{55}{3} \approx 18.33$$

Yes

$$\frac{165}{3} = 55 \text{ mph}$$

$$\frac{160}{t} \leq 55$$

Small book
box

$x = \#$ of small ~~box~~ ^(books)

$y = \#$ of big ~~books~~ ^{box} / large book
box

$$x + y \geq 35 \text{ boxes}$$

$$15x + 8y \geq 350 \text{ books}$$