

Systems of Equations Review

Name: Key

Do not solve problems 1-3, just set up the systems.

1) At a restaurant the cost for a breakfast taco and a small glass of milk is \$2.10. The cost for 2 tacos and 3 small glasses of milk is \$5.15. Use t and m as your variables.

t = cost of a taco
 m = cost of milk

$$\begin{cases} t + m = 2.10 \\ 2t + 3m = 5.15 \end{cases} \quad \begin{aligned} -2(t + m = 2.10) &\rightarrow -2t - 2m = -4.20 \\ \underline{2t + 3m = 5.15} & \\ m &= .95 \end{aligned}$$

$$\begin{aligned} t + .95 &= 2.10 \\ t &= 1.15 \end{aligned}$$

taco cost \$1.15, a glass of milk costs \$.95

2) The Frosty Ice-Cream Shop sells sundaes for \$2 and banana splits for \$3. On a hot summer day, the shop sold 8 more sundaes than banana splits and made \$156.

Δ = # of sundaes
 b = # of banana-splits

$$\begin{aligned} \Delta &= b + 8 \\ 2\Delta + 3b &= 156 \end{aligned} \quad \begin{aligned} \Delta &= 28 + 8 \\ \Delta &= 36 \end{aligned} \quad \begin{aligned} 2(b + 8) + 3b &= 156 \\ 2b + 16 + 3b &= 156 \\ 5b + 16 &= 156 \\ 5b &= 140 \\ b &= 28 \end{aligned}$$

28 banana splits & 36 sundaes

3) Two numbers have a sum of 22. The larger number is 3 less than four times the smaller number.

$x + y = 22$

x = larger y = smaller

$x = 4y - 3$

~~$x + y = 22$~~
 ~~$4y - 3 + y = 22$~~
 ~~$5y - 3 = 22$~~
 ~~$5y = 25$~~
 ~~$y = 5$~~

$y = 5$

$$\begin{aligned} x &= 4(5) - 3 \\ x &= 20 - 3 \\ x &= 17 \end{aligned}$$

17 and 5

4) Blanka and Chun-Li are working at rival martial arts dojos. Blanka charges a \$130 membership fee for the month plus \$4 per day for someone to train with him. Chun-Li charges \$36.50 per day with no fee. If someone was choosing which dojo to train with, how many days would they have to train where the cost would be the same? Set up and solve a system, using C for final cost and d for the number of days training.

$C = 130 + 4d$ $C = 36.50d$

$$\begin{aligned} 130 + 4d &= 36.50d \\ 130 &= 32.50d \\ 4 &= d \end{aligned}$$

4 days

set equal

5) If a system of equations has no solution, what does that mean about the lines when graphed?

They are parallel.
(Do not intersect.)

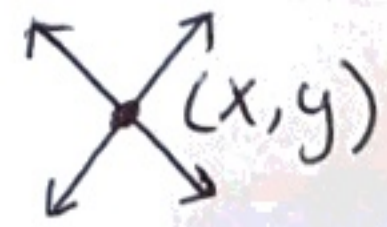


6) If a system of equations has an infinite number of solutions, what does that mean about the lines when graphed?

They are the same line.

7) If a system of equations has one solution, what does that mean about the lines?

They intersect



Use the following system of equations for questions 8 and 9.

$$x = -2y - 7$$

$$x + 5y = 20$$

8) What method would you use to solve the system? Substitution

(solved for variable)

9) What would the next step look like if you used the method you chose from question 8?

$$-2y - 7 + 5y = 20$$

10) Which ordered pair is a solution of the system of inequalities?

$$-x + y < 2$$

$$-6x + y \leq -3$$

A (0, 2)

B. (2, 4)

C (6, -1)

D. (1, 3)

$$-6 - 1 < 2 \checkmark$$

$$-6(6) - 1 \leq -3 \checkmark$$

11) To solve the system $\begin{cases} -5x + y = 9 \\ 3x - 2y = 10 \end{cases}$ by substitution, the most logical first step is to:

$$y = 5x + 9$$

solve first equation for y

12) To solve the system $\begin{cases} -4x + 5y = -8 \\ 4x - 2y = -11 \end{cases}$ by elimination, the most logical first step to eliminate x is to:

$$3y = -19$$

combine the equations

13) To solve the system $\begin{cases} -x - 5y = -2 \\ -3x - 2y = 1 \end{cases}$ by elimination, the most logical first step to eliminate y is to:

$$-2x + 10y = 4 \quad \text{multiply top equation by } -2$$

$$-15x - 10y = 5 \quad \text{multiply the bottom by } 5$$

14) To solve the system $\begin{cases} 7x - 8y = 2 \\ -x - y = 0 \end{cases}$ by elimination, the most logical first step to eliminate x is to:

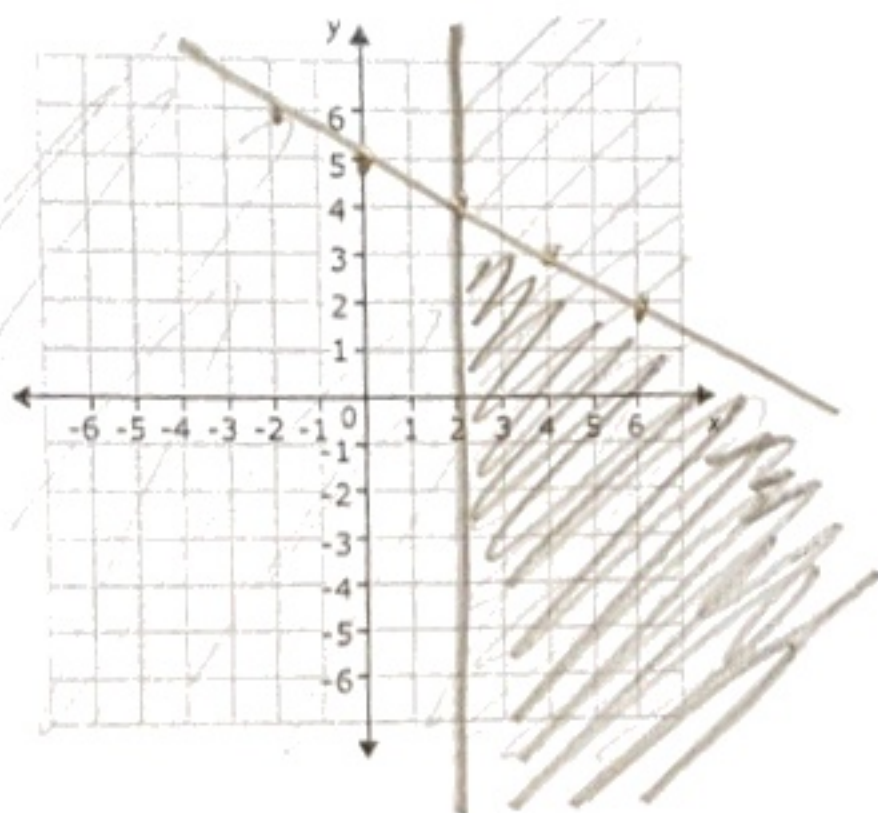
$$7x - 8y = 2$$

$$-7x - 7y = 0$$

multiply second equation by 7

Graph the following systems of inequalities

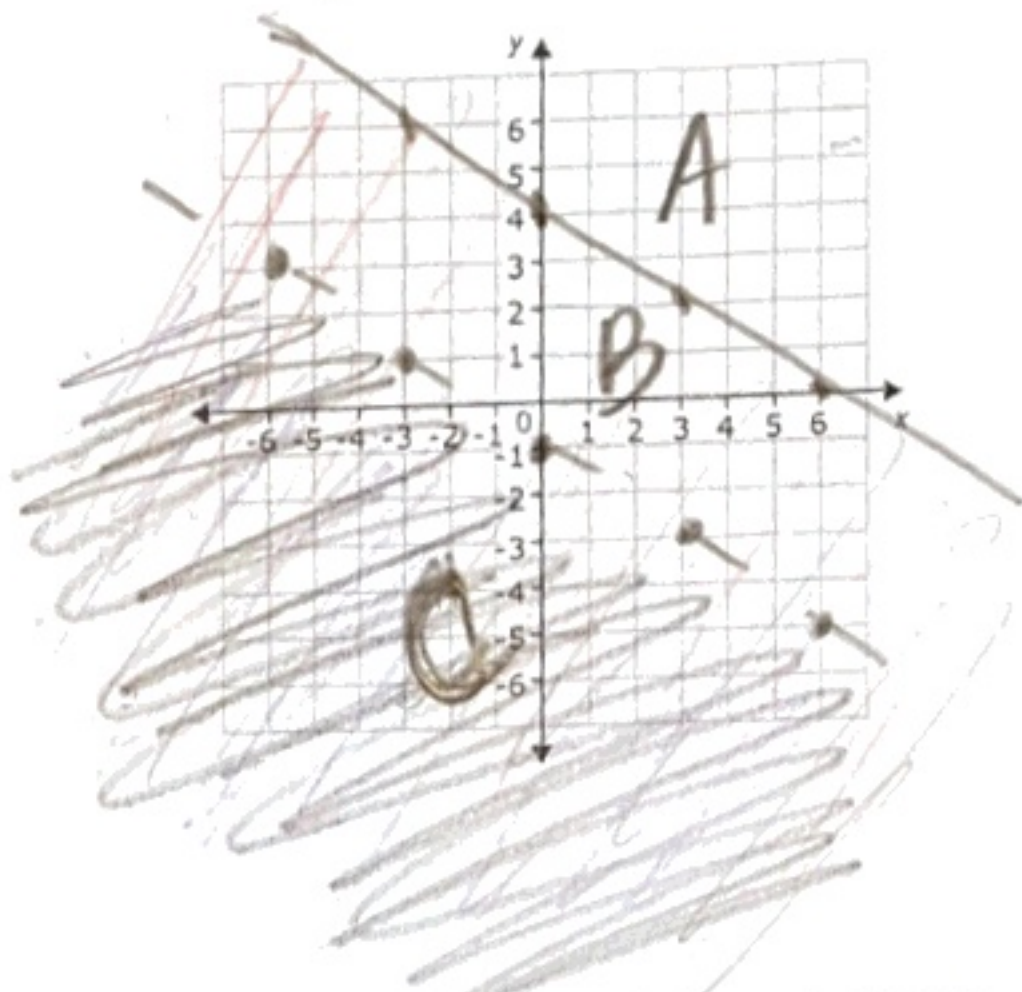
15) $x \geq 2$
 $y \leq -\frac{1}{2}x + 5$



16)

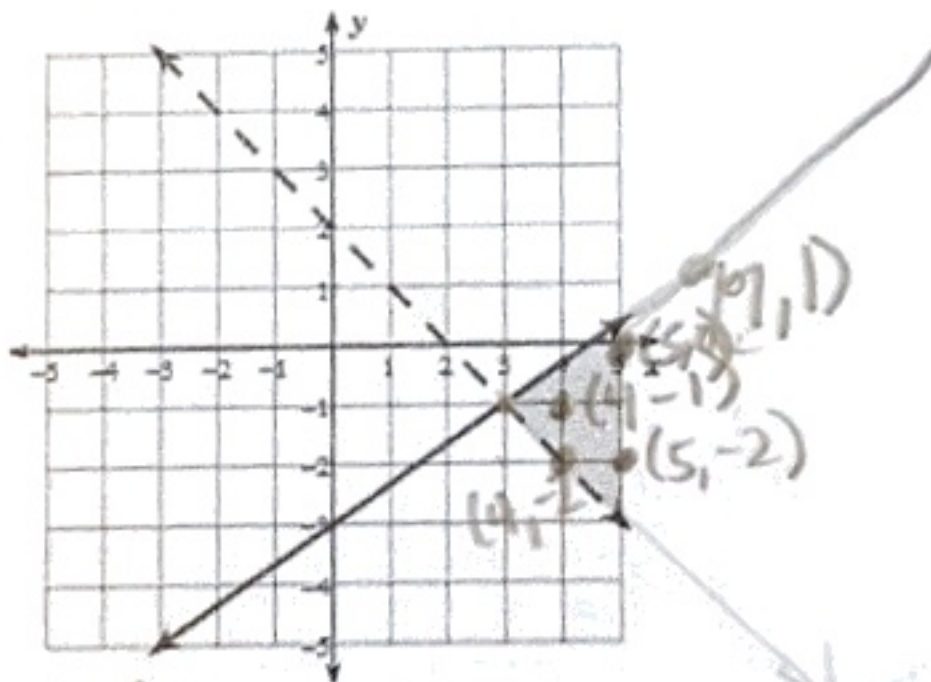
$y < -\frac{2}{3}x - 1$
 $y \leq -\frac{2}{3}x + 4$

Region C is solution



17) The following graph shows the solution to a system of inequalities. Circle ALL points that are solutions to the system.

$y \leq \frac{2}{3}x - 3$
 $y > -x + 2$



~~ii.~~ (4, -2) NO
 iv. (5, 0) YES

~~i.~~ (3, -1) NO
 v. (5, -2) YES

iii. (4, -1) YES
 vi. (7, 1) YES