Intermediate Algebra Name Key

# Chapter 3 Review

1. Is (-3, -8) a solution to: $\begin{cases} 2x+y=-14 \\ -2x+3y=22 \end{cases}$

① $2(-3)+(-8)=-14$
$-6-8=-14$
$-14=-14$ ✓

② $-2(-3)+3(-8)=22$
$6-24=22$
$-18 \neq 22$

Not a solution

Solve using any method.

2. $\begin{cases} 4x+2y=2 \\ 5x-2y=-11 \end{cases}$ (-1, 3)

$9x=-9$
$\frac{9x}{9}=\frac{-9}{9}$
$x=-1$

$4(-1)+2y=2$
$-4+2y=2$
$+4 \quad +4$
$\frac{2y}{2}=\frac{6}{2}$
$y=3$

3. $\begin{cases} 2(6x-5y=28) \\ -3(4x+9y=-6) \end{cases}$

$12x-10y=56$
$-12x-27y=18$
$-37y=74$
$\frac{-37y}{-37}=\frac{74}{-37}$
$y=-2$

$4x+9(-2)=-6$
$4x-18=-6$
$+18 \quad +18$
$\frac{4x}{4}=\frac{12}{4}$
$x=3$

(3, -2)

4. $\begin{cases} y=2x-1 \\ -3x+4y=11 \end{cases}$

$-3x+4(2x-1)=11$
$-3x+8x-4=11$
$5x-4=11$
$+4 \quad +4$
$5x=15$
$x=3$

$y=2(3)-1$
$y=6-1$
$y=5$

(3, 5)

5. $\begin{cases} 2(2x-y=4) \\ 4x-2y=8 \end{cases}$ →

$-4x+2y=-8$
$+ \quad 4x-2y=8$
$0=0$

# = # → IMS

6. How many solutions are there to the following systems? **Explain your answer.**

$\begin{cases} 2x+3y=12 \\ 6x+9y=36 \end{cases}$

No Solution!

IMS!

$\begin{cases} 4x-2y=6 \\ 2x-y=1 \end{cases}$

No Solution!

$\begin{cases} 2x+3y=12 \\ 3x+y=18 \end{cases}$

One Solution

7. $-x-5y-5z=2$
$4x-5y+4z=19$
$x+5y-z=-20$

① eq 1 + eq 3

$-x-5y-5z=2$
$+\ x+5y-z=-20$

$-6z=-18$

$\frac{-6z}{-6}=\frac{-18}{-6}$

$z=3$

② eq 2 + eq 3

$4x-5y+4z=19$
$+\ x+5y-z=-20$

$5x+3z=-1$

③ $-(-2)-5y-5(3)=2$

$2-5y-15=2$

$-5y-13=2$
$+13\quad +13$

$\frac{-5y}{-5}=\frac{15}{-5}$

$y=-3$

$5x+3(3)=-1$

$5x+9=-1$
$-9\quad -9$

$\frac{5x}{5}=\frac{-10}{5}$

$x=-2$

$\boxed{(-2,-3,3)}$

8. Solve by graphing

$2x-3y=6$
$x+y=8 \rightarrow y=-x+8$

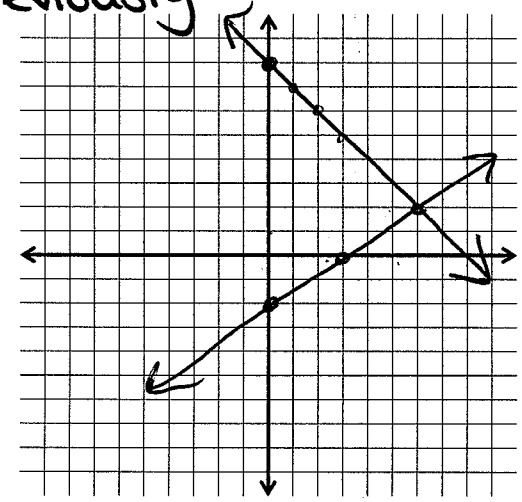
Note: this problem is slightly different than ones we have done previously

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

$\frac{-3y}{-3}=\frac{-2x+6}{-3}$

$y=\frac{2}{3}x-2$

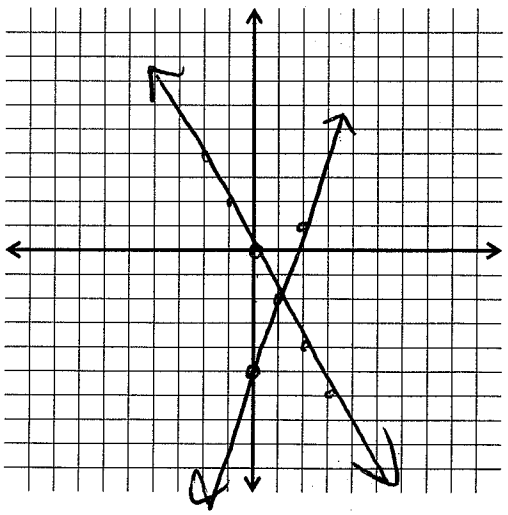
$\boxed{(6,2)}$



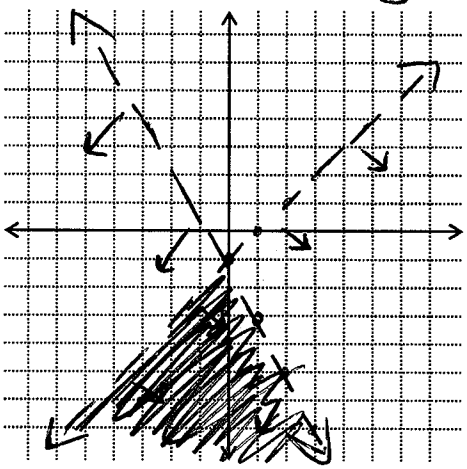
9. Solve by graphing:

$y=-2x$
$3x-y=5 \rightarrow y=3x-5$

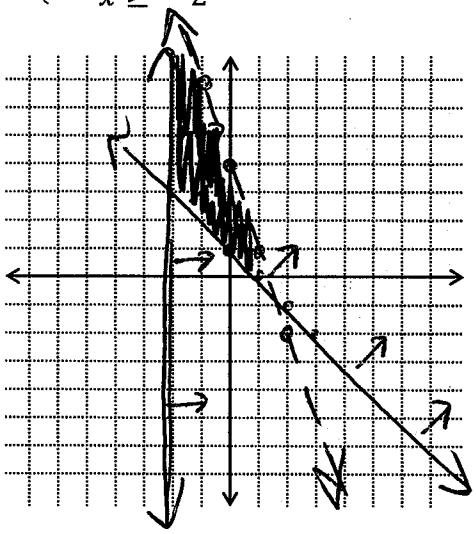
$\boxed{(1,-2)}$



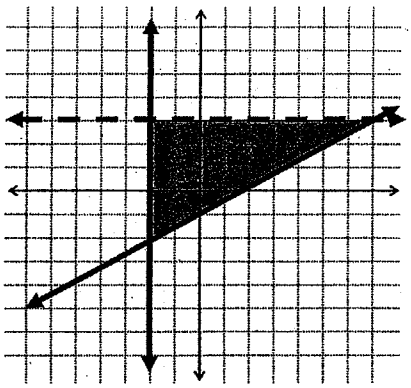
10. $\begin{cases} x - y > 1 \\ 2x + y < -1 \end{cases}$ → $y < x - 1$, $y < -2x - 1$



11. $\begin{cases} -3x - y > -4 \\ y \geq -x + 1 \\ x \geq -2 \end{cases}$ → $y < -3x + 4$



12. Determine the system of linear inequalities for the given feasible region:



$x \geq -2$

$y < 3$

$y \geq \frac{1}{2}x - 1$

$73.50

13. A health food store wishes to blend peanuts that cost $1.20 per pound with raisins that cost $2.10 per pound to make a 50 pound mixture that costs $1.47 per pound. How many pounds of peanuts and raisins are needed?

p = lbs of peanuts

r = lbs of raisins

System:

$p + r = 50$

$1.20p + 2.10r = 73.50$

$-1.20(p + r = 50)$

$1.20p + 2.10r = 73.50$

$-1.20p - 1.20r = -60$

$+1.20p + 2.10r = 73.50$

$\frac{0.90r}{.90} = \frac{13.5}{.90}$

$r = 15$

$p + 15 = 50$

$-15 \quad -15$

$p = 35$

15 lbs of raisins

35 lbs of peanuts

14. A softball team raised $528 selling hats and T-shirts. The hats sold for $10 each, while the T-shirts sold for $12 each. The team sold a total of 47 items. How many of each item was sold?

h = hats
t = t-shirts

system:
$h + t = 47$
$10h + 12t = 528$

$-10h - 10t = -470$
$+\ 10h + 12t = 528$
$2t = 58$
$t = 29$

$h + 29 = 47$
$-29 \quad -29$
$h = 18$

29 t-shirts
18 hats

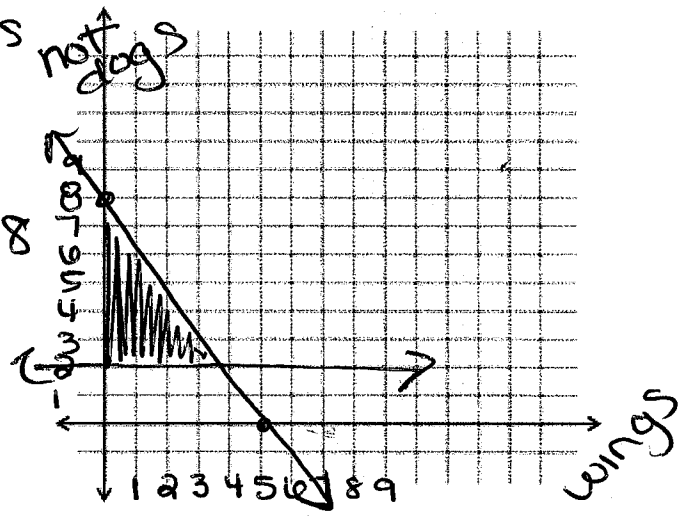
15. Jason is buying wings and hot dogs for a party. One package of wings costs $8 and hot dogs cost $5 per pound. Jason only has $40 to spend on food. Also, he knows that he will by buying at least 2 pounds of hot dogs.

x = wings
y = hot dogs

Write a system of linear inequalities to model the situation.

$y \geq 2$
$8x + 5y \leq 40 \rightarrow y \leq -\frac{8}{5}x + 8$

Graph the system of inequalities.




Determine one possible combination of wings and hot dogs.
wings = 2 hot dogs = 3

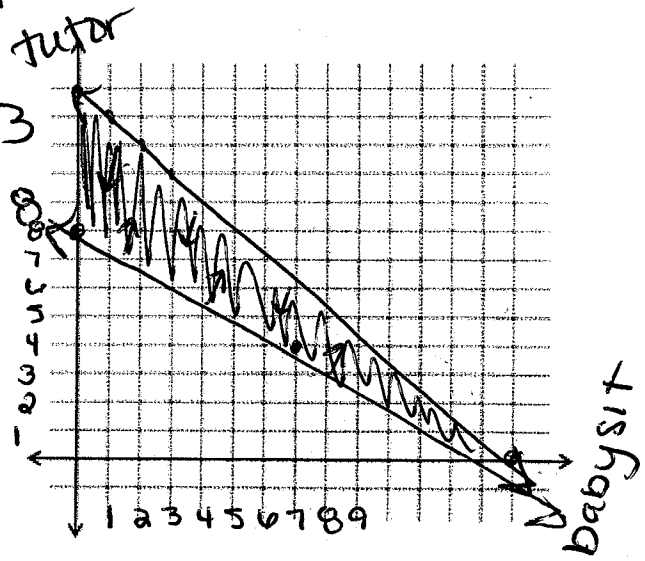
16. Mary babysits for $4 per hour. She also works as a tutor for $7 per hour. He mom only allows her to work 13 hours per week. She wants to make at least $56 in a week.

y = tutor x = babysit

Write and solve a system of linear inequalities to represent the situation.

$x + y \leq 13 \rightarrow y \leq -x + 13$
$4x + 7y \geq 56 \quad y \geq -\frac{4}{7}x + 8$

Graph the system of inequalities.




Determine one possible combination of babysitting and tutoring.
3 hrs babysitting
8 hrs tutoring