

Math 1B Practice Test: Unit 6

Find the solution by graphing.

If there is no solution or infinitely many, explain why.

Parallel

Same line

y-int: $y = -8$

#1. $\begin{cases} -2x + y = -8 \\ 2x + 4y = 8 \end{cases}$

x-int: $\rightarrow -2x = -8$
 $\frac{-2x}{-2} = \frac{-8}{-2}$
 $x = 4$

y-int: $\rightarrow 2x + 4y = 8$
 $\frac{2x}{2} + \frac{4y}{4} = \frac{8}{4}$
 $x + y = 2$
 $y = 2 - x$

GRAPH

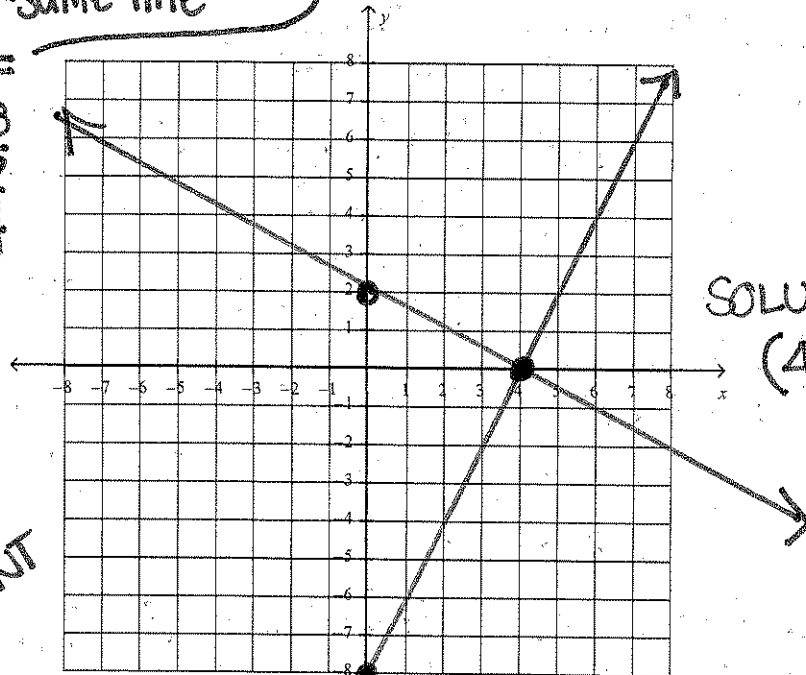
COVER UP METHOD

SOLVE FOR Y

$Y = MX + B$

SLOPE Y-INT

FIND WHERE IT CROSSES



SOLUTION IS $(4, 0)$

#2. $\begin{cases} -3x + 2 = y \\ 3x + y = -2 \end{cases}$

~~slope: -3~~ slope: -3
 y-int = 2

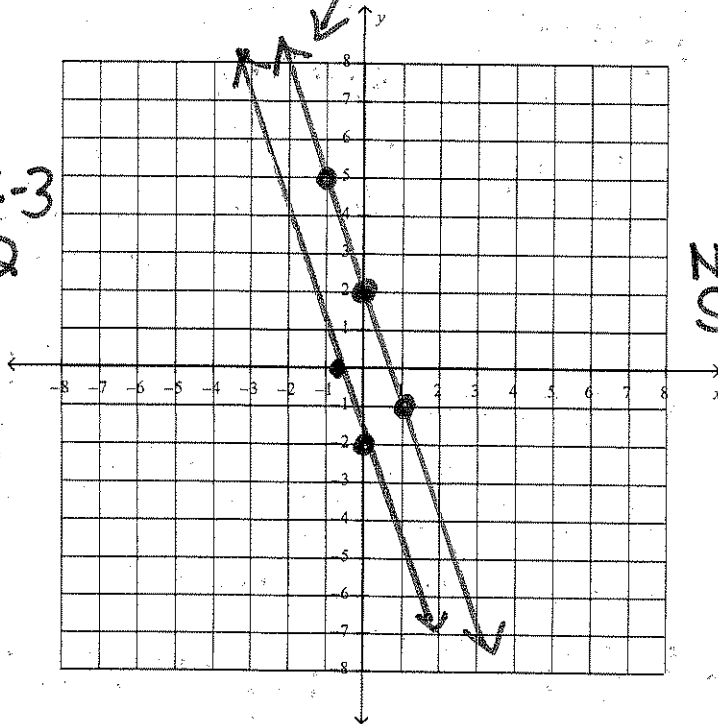
x-int:

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

$x = -2/3$

y-int:

$y = -2$



NO SOLUTION

Solve the following systems of equations algebraically.
Show all work and check only #3.

#3. $\begin{cases} y = 4x + 10 \\ y = 3x + 9 \end{cases}$ $(-1, 6)$

$$\begin{array}{r} 4x + 10 = 3x + 9 \\ -3x \quad -3x \\ \hline x + 10 = 9 \\ -10 \quad -10 \\ \hline x = -1 \end{array}$$

TO CHECK THE SOLUTION:

$$\begin{array}{l} 6 = 4(-1) + 10 \\ 6 = -4 + 10 \\ 6 = 6 \checkmark \\ 6 = 3(-1) + 9 \\ 6 = -3 + 9 \\ 6 = 6 \checkmark \end{array}$$

#5. $\begin{cases} 8(7x - 10y) = (-24) \\ 7(8x - 7y) = (-23) \end{cases}$ $(-2, 1)$

$$\begin{array}{r} 56x - 80y = -192 \\ 56x - 49y = -161 \\ \hline -31y = -31 \\ \frac{-31y}{-31} = \frac{-31}{-31} \\ y = 1 \end{array}$$

$$\begin{array}{r} 7x - 10(1) = -24 \\ 7x - 10 = -24 \\ +10 \quad +10 \\ \hline 7x = -14 \\ \frac{7x}{7} = \frac{-14}{7} \\ x = -2 \end{array}$$

ELIMINATION OR COMBINATION PGS 3-5

#4. $\begin{cases} 3x - 6y = 30 \\ 6(6x + y) = (34)6 \end{cases}$ $(6, -2)$

$$\begin{array}{r} 3x - 6y = 30 \\ 36x + 6y = 204 \\ \hline 39x = 234 \\ \frac{39x}{39} = \frac{234}{39} \\ x = 6 \end{array}$$

$$\begin{array}{r} 3(6) - 6y = 30 \\ 18 - 6y = 30 \\ -18 \quad -18 \\ \hline -6y = 12 \\ \frac{-6y}{-6} = \frac{12}{-6} \\ y = -2 \end{array}$$

#6. $\begin{cases} 2(3x + 2y) = (10)2 \\ -6x - 4y = -20 \end{cases}$

$$\begin{array}{r} 6x + 4y = 20 \\ -6x - 4y = -20 \\ \hline 0 = 0 \end{array}$$

↑ NO VARIABLES, TRUE STATEMENT

INFINITELY MANY SOLUTIONS

#7. Suppose you bought supplies for a party. Three rolls of streamers and fifteen party hats cost \$30. Later, you bought two rolls of streamers and four party hats for \$11. Write and solve a system of equations to determine the cost of streamers and party hats, find their costs. REFER TO P. 9

- ① WRITE EQUATIONS
- ② SOLVE USING ELIM. OR COMBO.
- ③ TAKE YOUR SOLUTION: SUB BACK INTO BOTH EQUATIONS

$x =$ cost of streamers
 $y =$ cost of hats

STREAMERS COST \$2.50
HATS COST \$1.50

$\begin{cases} 3x + 15y = 30 \\ 2x + 4y = 11 \end{cases}$ my equations

$$\begin{array}{r} 2x + 4(1.50) = 11 \\ 2x + 6 = 11 \\ -6 \quad -6 \\ \hline 2x = 5 \\ \frac{2x}{2} = \frac{5}{2} \quad x = 2.5 \end{array}$$

$$\begin{array}{r} 2(3x + 15y) = (30)2 \\ 3(2x + 4y) = (11)3 \end{array}$$

$$\begin{array}{r} 6x + 30y = 60 \\ -6x + 12y = 33 \\ \hline 18y = 27 \\ \frac{18y}{18} = \frac{27}{18} \quad y = 1.50 \end{array}$$

I chose to solve by elimination

#8. Sam needs to rent a car for a one-week trip to Oregon. He is considering two companies:

A+ Auto Rental: \$175 plus \$0.10 per mile $\rightarrow y = .10x + 175$

Zippy Auto Rental: \$220 plus \$0.05 per mile. $\rightarrow y = .05x + 220$

$x = \#$ of miles driven $y = \text{cost}$

Write and solve a system of equations to determine when the rental costs are the same for both companies.

$$\begin{array}{r} .10x + 175 = .05x + 220 \\ -.05x \quad \quad -.05x \\ \hline .05x + 175 = 220 \end{array}$$

$$\begin{array}{r} .05x + 175 = 220 \\ 175 \quad -175 \\ \hline .05x = 45 \end{array}$$

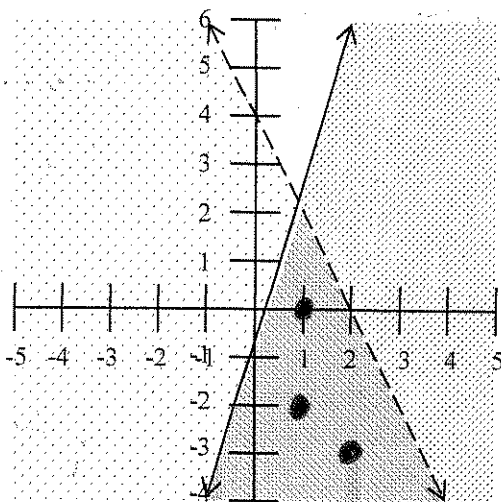
$$\begin{array}{r} .05x = 45 \\ .05 \quad .05 \\ \hline x = 900 \end{array}$$

cost is the same when miles driven is 900.

State three solutions to the following system of inequalities.

#9.

- (1, 0)
- (1, -2)
- (2, -3)



#10. You have a gift certificate to a book store worth \$60. Each paperback book is \$4 and each hardcover book is \$15. You must buy at least 5 books in order to use the gift certificate.

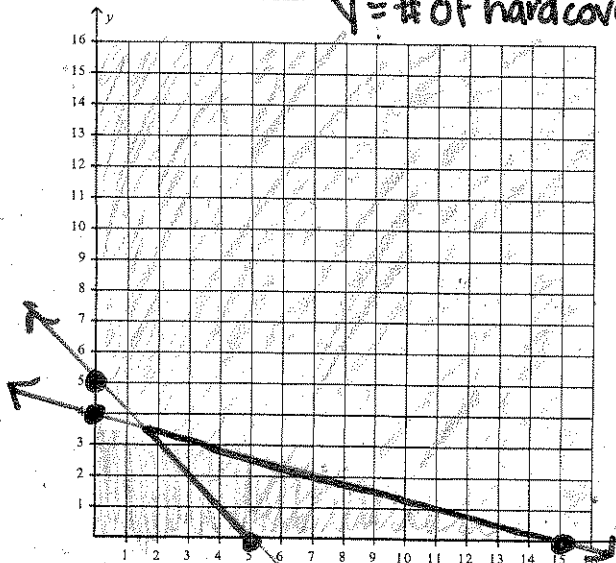
- a) Write and graph a system of inequalities to model the number of each kind of books you can buy. Be sure to label all parts of your graph.
- b) State at least one solution set that would work.

$$\begin{aligned} \textcircled{1} & 4x + 15y \leq 60 \\ & x + y \geq 5 \end{aligned}$$

$$\begin{aligned} \textcircled{2} \text{ x int: } & 4x = 60 \\ & x = 15 \\ \text{y-int: } & 15y = 60 \\ & y = 4 \end{aligned}$$

$$\begin{aligned} \text{x-int: } & x = 5 \\ \text{y-int } & y = 5 \end{aligned}$$

$$\begin{aligned} \textcircled{5} & 4(0) + 15(0) \leq 60 & 0 + 0 \geq 5 & 3 \\ & 0 \leq 60 & 0 \geq 5 & \leftarrow \text{NOT TRUE} \end{aligned}$$



- $x = \#$ of paperbacks REFER TO
 $y = \#$ of hardcovers P. 27 = 28
- ① WRITE INEQ.
 - ② FIND X & Y INT
 - ③ PLOT
 - ④ DRAW LINE
 - ⑤ TEST A POINT
 - ⑥ SHADE
- B) ONE POSSIBLE SOLUTION:
2 paperbacks
5 paperbacks
2 hardcovers

SUB OR ELEM P3 #1

Solve the following systems algebraically. Hint: set them equal and solve for x, then find y.

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

$$\begin{array}{r} x - 1 = -x + 3 \\ +x \quad +x \\ \hline 2x - 1 = 3 \end{array}$$

$$\begin{array}{r} 2x - 1 = 3 \\ +1 \quad +1 \\ \hline 2x = 4 \\ \frac{2x}{2} = \frac{4}{2} \\ x = 2 \end{array}$$

$$\begin{array}{r} y = 2 - 1 \\ = 1 \end{array}$$

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

$$\begin{array}{r} 4x + 6 = 2x + 2 \\ -2x \quad -2x \\ \hline 2x + 6 = 2 \end{array}$$

$$\begin{array}{r} 2x + 6 = 2 \\ -6 \quad -6 \\ \hline 2x = -4 \\ \frac{2x}{2} = \frac{-4}{2} \\ x = -2 \end{array}$$

$$\begin{array}{r} y = 4(-2) + 6 \\ = -8 + 6 \\ = -2 \end{array}$$
(-2, -2)

4. $\begin{cases} y = 22x + 4 \\ y = 14x + 28 \end{cases}$

$$\begin{array}{r} 22x + 4 = 14x + 28 \\ -14x \quad -14x \\ \hline 8x + 4 = 28 \end{array}$$

$$\begin{array}{r} 8x + 4 = 28 \\ -4 \quad -4 \\ \hline 8x = 24 \end{array}$$

$$\begin{array}{r} 8x = 24 \\ \frac{8x}{8} = \frac{24}{8} \\ x = 3 \end{array}$$

$$\begin{array}{r} y = 14(3) + 28 \\ = 42 + 28 \\ = 70 \end{array}$$
(3, 70)

3. $\begin{cases} y = -5x + 8 \\ y = -2x - 7 \end{cases}$

$$\begin{array}{r} -5x + 8 = -2x - 7 \\ +2x \quad +2x \\ \hline -3x + 8 = -7 \end{array}$$

$$\begin{array}{r} -3x + 8 = -7 \\ -8 \quad -8 \\ \hline -3x = -15 \end{array}$$

$$\begin{array}{r} -3x = -15 \\ \frac{-3x}{-3} = \frac{-15}{-3} \\ x = 5 \end{array}$$

$$\begin{array}{r} y = -2(5) - 7 \\ = -10 - 7 \\ = -17 \end{array}$$
(5, -17)

Solve by elimination. Show your work. Circle your answer.

5. $\begin{cases} x + 2y = 7 \\ 3x - 2y = -3 \end{cases}$

$$\begin{array}{r} x + 2y = 7 \\ + 3x - 2y = -3 \\ \hline 4x = 4 \end{array}$$

$$\begin{array}{r} 4x = 4 \\ \frac{4x}{4} = \frac{4}{4} \\ x = 1 \end{array}$$

$$\begin{array}{r} 1 + 2y = 7 \\ -1 \quad -1 \\ \hline 2y = 6 \\ \frac{2y}{2} = \frac{6}{2} \\ y = 3 \end{array}$$

(1, 3)

6. $\begin{cases} 3x + y = 20 \\ x + y = 12 \end{cases}$

$$\begin{array}{r} 3x + y = 20 \\ - x + y = 12 \\ \hline 2x = 8 \end{array}$$

$$\begin{array}{r} 2x = 8 \\ \frac{2x}{2} = \frac{8}{2} \\ x = 4 \end{array}$$

$$\begin{array}{r} 4 + y = 12 \\ -4 \quad -4 \\ \hline y = 8 \end{array}$$
(4, 8)

7. $\begin{cases} 2x + 5y = -1 \\ x + 2y = 0 \end{cases}$

$$\begin{array}{r} 2x + 5y = -1 \\ -2(x + 2y) = -2(0) \\ \hline 2x + 5y = -1 \\ -2x - 4y = 0 \\ \hline y = -1 \end{array}$$

$$\begin{array}{r} x + 2(-1) = 0 \\ x - 2 = 0 \\ +2 \quad +2 \\ \hline x = 2 \end{array}$$

(2, -1)

8. $\begin{cases} 3x + 5y = 10 \\ x - 5y = -10 \end{cases}$

$$\begin{array}{r} 3x + 5y = 10 \\ + x - 5y = -10 \\ \hline 4x = 0 \end{array}$$

$$\begin{array}{r} 4x = 0 \\ \frac{4x}{4} = \frac{0}{4} \\ x = 0 \end{array}$$

$$\begin{array}{r} 0 - 5y = -10 \\ -5y = -10 \\ \frac{-5y}{-5} = \frac{-10}{-5} \\ y = 2 \end{array}$$
(0, 2)

9. $\begin{cases} -6x - 4y = 21 \\ -6x + 3y = 0 \end{cases}$

$$\begin{array}{r} -6x - 4y = 21 \\ -6x + 3y = 0 \\ \hline -7y = 21 \end{array}$$

$$\begin{array}{r} -7y = 21 \\ \frac{-7y}{-7} = \frac{21}{-7} \\ y = -3 \end{array}$$

$$\begin{array}{r} -6x + 3(-3) = 0 \\ -6x - 9 = 0 \\ +9 \quad +9 \\ \hline -6x = 9 \\ \frac{-6x}{-6} = \frac{9}{-6} \\ x = -\frac{3}{2} = -1.5 \end{array}$$
(-1.5, -3)

10. $\begin{cases} 3x + 6y = 6 \\ 2x - 3y = 4 \end{cases}$

$$\begin{array}{r} 3x + 6y = 6 \\ -2(2x - 3y) = -2(4) \\ \hline 3x + 6y = 6 \\ -4x + 6y = -8 \\ \hline 7x = 14 \end{array}$$

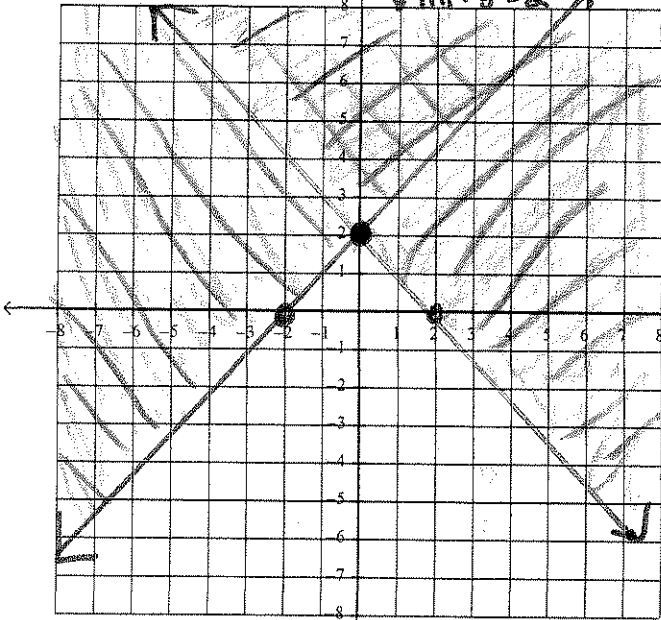
$$\begin{array}{r} 7x = 14 \\ \frac{7x}{7} = \frac{14}{7} \\ x = 2 \end{array}$$

FOLLOW STEPS ^{on} p23 ÷ 24

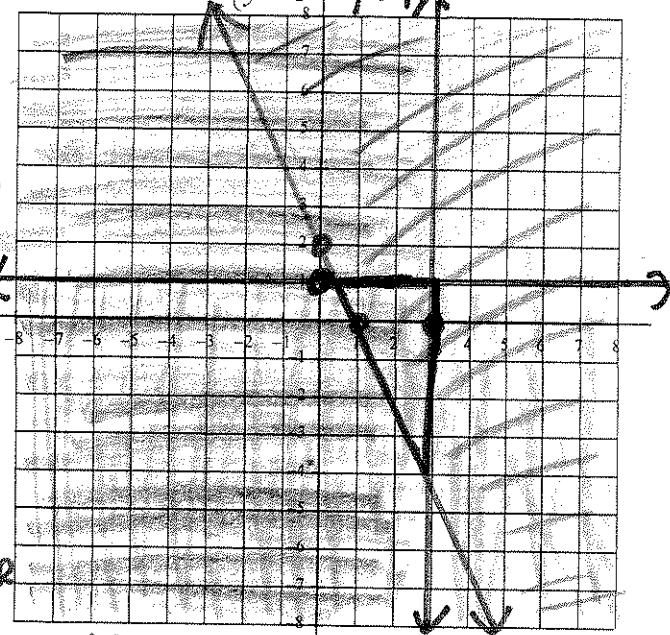
Graph the system of linear inequalities. Choose the correct type of line and shade in the correct spot.

11. Graph $\begin{cases} x - y \leq -2 \\ x + y \geq 2 \end{cases}$
 x int: $x = -2$
 y int: $y = 2$
 x int: $x = 2$
 y int: $y = -2$

- ① FIND X & Y INT
- ② PLOT
- ③ DRAW LINE
- DOTTED
- SOLID
- ④ TEST A PT.
(0, 0)
- ⑤ SHADE
- IF TRUE SHADE OVER (0, 0)



12. Graph $\begin{cases} 2x + y \geq 2 \\ x \leq 3 \\ y < 1 \end{cases}$
 x int: $x = 1$
 y int: $y = 2$
 $x = 3$
 $y = 1$



$0 - 0 \leq -2$
 $0 \leq -2$
 FALSE

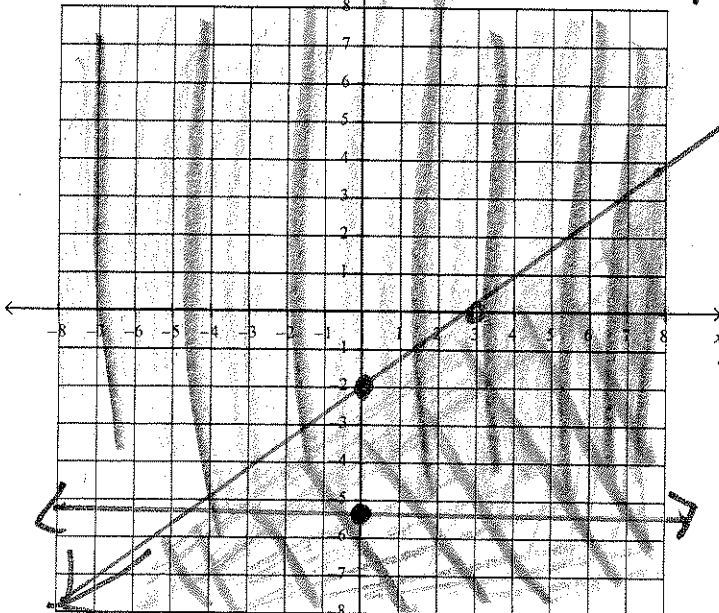
$0 + 0 \geq 2$
 $0 \geq 2$
 FALSE

- IF FALSE, SHADE ON OPP. SIDE

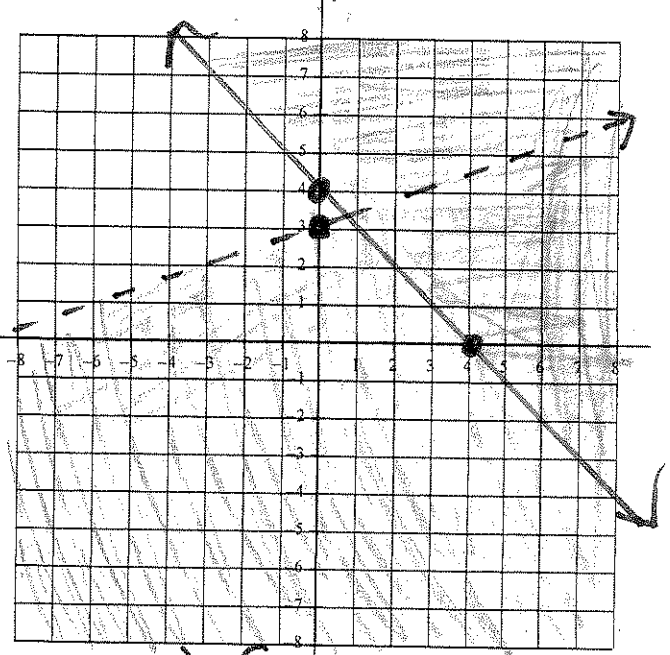
$2(0) + 0 \geq 2$
 $0 \geq 2$
 FALSE

$0 \leq 3$ ✓
 $0 < 1$ ✓

13. Graph $\begin{cases} 2x - 3y \geq 6 \\ -3 + 4y \geq -24 \end{cases}$
 x int: $x = 3$ y int: $y = -2$
 $\frac{4y}{4} \geq \frac{-24}{4}$ $y \geq -6$



14. Graph $\begin{cases} -x + 3y < 9 \\ x + y \geq 4 \end{cases}$
 x int: $x = -9$ y int: $y = 3$
 x int: $x = 4$ y int: $y = 4$



$2(0) - 3(0) \geq 6$
 $0 \geq 6$
 FALSE

$-3 + 4(0) \geq -24$
 $-3 + 0 \geq -24$
 $-3 \geq -24$ ✓

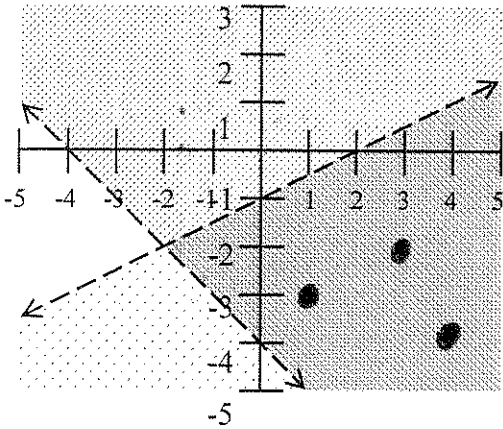
$-0 + 3(0) < 9$
 $0 < 9$

$0 + 0 \geq 4$
 $0 \geq 4$
 FALSE

Write three ordered pairs that would be a solution to these systems. SAME AS

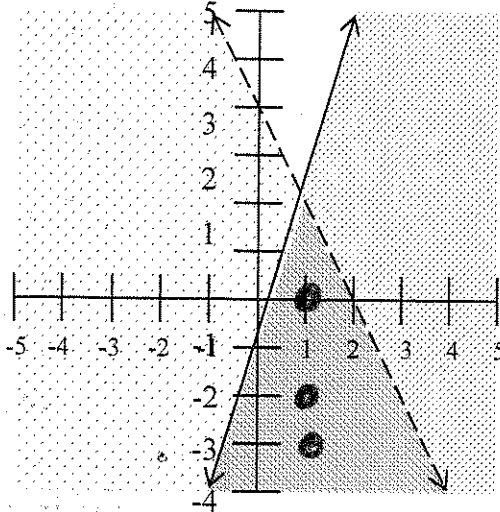
15.

$(4, -4)$ $(1, -3)$
 $(3, -2)$

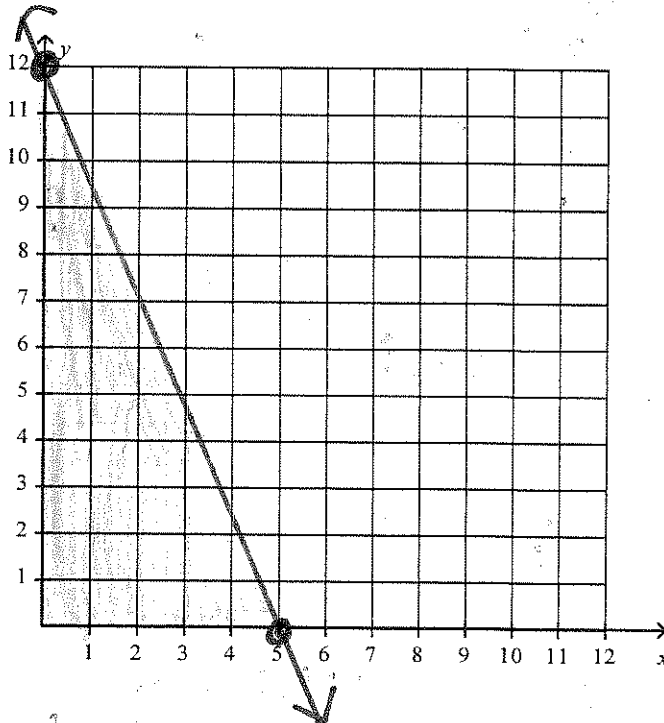


16.

#9
 $(1, -2)$ $(1, 0)$ $(1, -3)$



17. Suppose you intend to spend no more than \$60 buying books. Hardback books cost \$12 and paperback cost \$5. How many books of each type can you buy? SAME AS #10



Anywhere
 in the shaded
 area is a solution →

$$\textcircled{1} 12x + 5y \leq 60$$

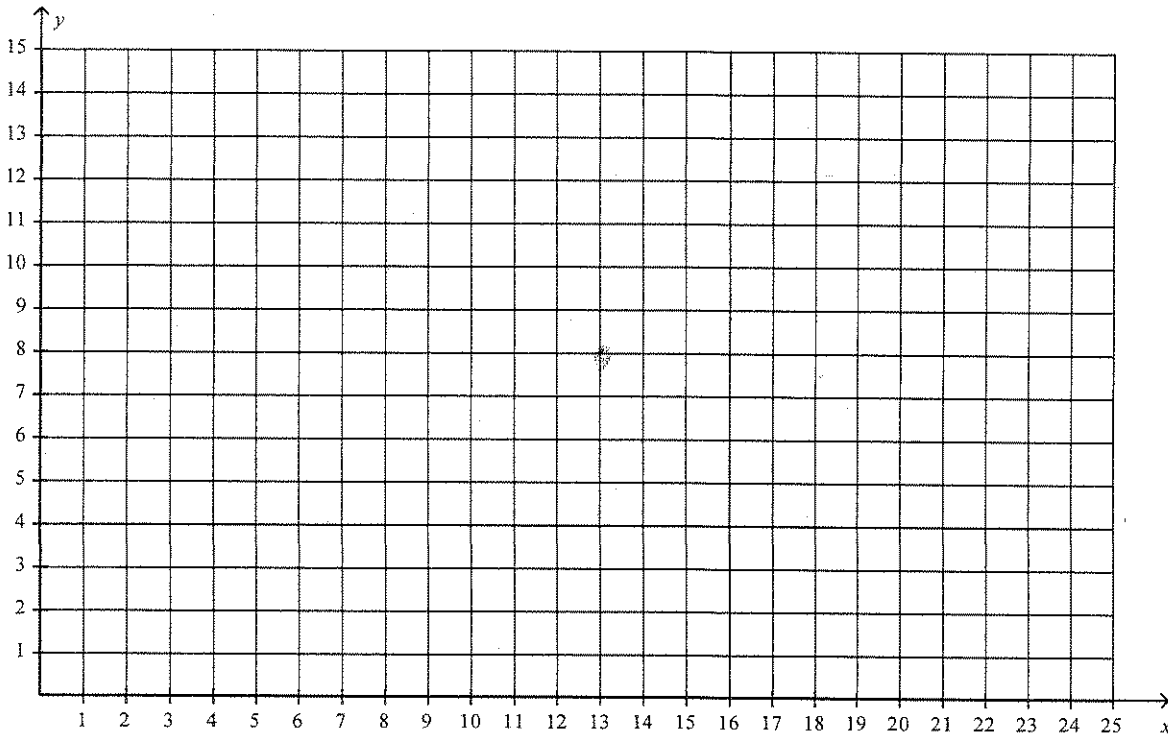
$x \div y$ int:
 $x = 5$
 $y = 12$

TEST A POINT
 $12(0) + 5(0) \leq 60$
 $0 \leq 60$

SAME AS #10

18. Miss Jones wants to buy at least 10 books. Each paperback book costs an average of \$10 and each hardcover book costs an average of \$20. Miss Jones is planning to spend less than \$240 on books.

We'll talk about these
before the test tomorrow



19. The science club wants to buy t-shirts for the organization. They have a budget of \$120. Plain white t-shirts cost \$3 and red t-shirts with writing costs \$6. There are 20 students in the club but all are not sure if they are going to purchase a t-shirt.

SAME AS 10

