

Key

Unit 1A Practice Test

1. Solve the system $\begin{cases} -10x + y = 40 \\ -5x + 3y = -5 \end{cases}$ using either substitution or elimination.

$$(-5, -10)$$

2. Solve the system $\begin{cases} 4x + 5y = -2 \\ 5x = 5 - 10y \end{cases}$ using either substitution or elimination.

$$(-3, 2)$$

3. Solve the system $\begin{cases} 7x + 3y = -9 \\ 3y = x + 15 \end{cases}$ using either substitution or elimination.

$$(-3, 4)$$

4. Solve the system of equations by substitution.

$$\begin{cases} 4x - y = -7 \\ -3x + 2y = 4 \end{cases}$$

$$(-2, -1)$$

5. Solve the system of equations by substitution.

$$\begin{cases} 4x + 3y = -1 \\ 9x + y = -8 \end{cases}$$

$$(-1, 1)$$

6. Solve the system $\begin{cases} -10x + y = 40 \\ -5x + 3y = -5 \end{cases}$ using elimination.

7. Solve the system $\begin{cases} 4x + 5y = -2 \\ 5x = 5 - 10y \end{cases}$ using elimination.

8. Solve the system of equations by any algebraic method.

$$-2x + 3y = 8$$

$$3x + 5y = -12$$

$$(-4, 0)$$

9. Solve the system of equations by linear combinations.

$$6x + 5y = 11$$

$$4x - 2y = 34$$

$$(6, -5)$$

10. Solve the system of equations using any method.

$$\boxed{(0,0)}$$

$$\begin{aligned} 3x + 4y = 0 &\Rightarrow *1 \\ 9x + 4y = 0 & \end{aligned}$$

$$\begin{array}{r} -3x - 4y = 0 \\ 9x + 4y = 0 \\ \hline 6x = 0 \quad x = 0 \end{array}$$

$$\begin{aligned} 9(0) + 4y &= 0 \\ 4y &= 0 \\ y &= 0 \end{aligned}$$

11. Solve the system of equations using any method.

$$\boxed{\left(\frac{256}{93}, \frac{4}{31}\right)}$$

$$\begin{aligned} 5x + 7y = 12 &\Rightarrow *3 \\ 3x - 2y = 8 &\Rightarrow *5 \end{aligned}$$

$$\begin{array}{r} 15x + 21y = 36 \\ -15x + 10y = -40 \\ \hline 31y = \frac{-4}{31} \end{array}$$

$$3x - 2\left(\frac{4}{31}\right) = 8$$

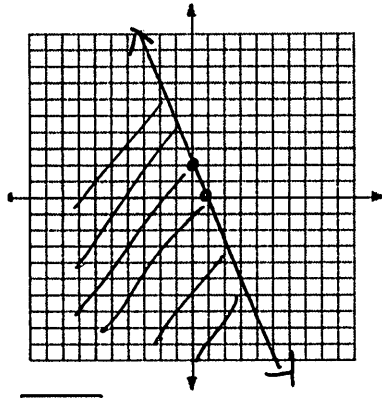
$$3x - \frac{8}{31} = 8 \quad 3x = \frac{256}{31} \quad x = \frac{256}{93}$$

12. Graph the equation $-6x - 2y \geq -4$

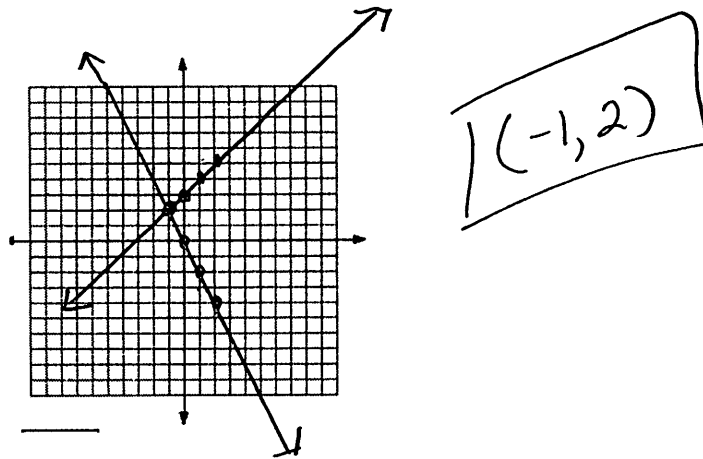
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x-int: $\frac{2}{3}$

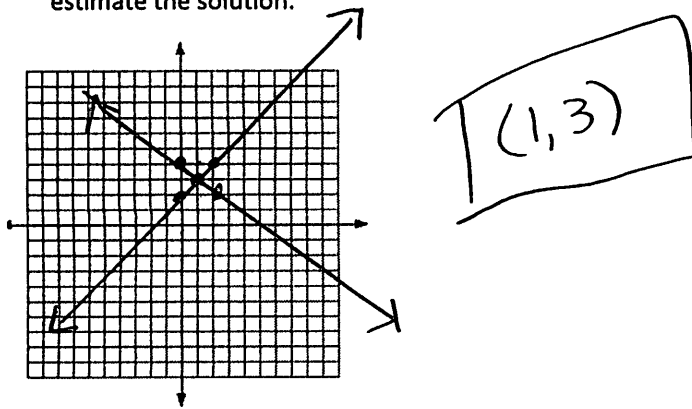
y-int: 2



13. Graph $y = -2x$ and $y = x + 3$ and tell how many solutions it has. If there is exactly one solution, estimate the solution.



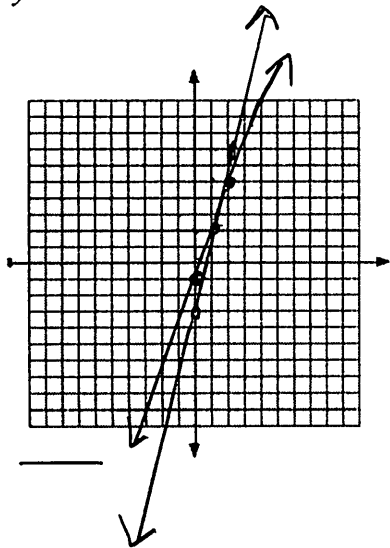
14. Graph $y = x + 2$ and $y = -x + 4$ and tell how many solutions it has. If there is exactly one solution, estimate the solution.



15. Solve the system of equations by graphing.

$$y = 5x - 3$$

$$y = 3x - 1$$

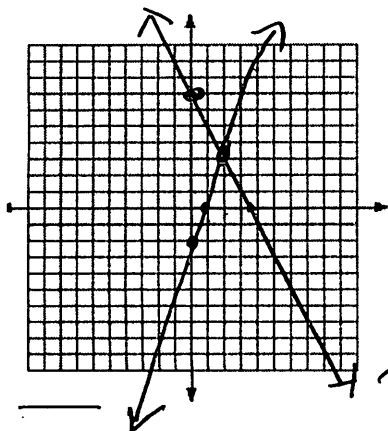


$(1, 2)$

16. Solve the system of equations by graphing.

① $2x + y = 7$

② $5x - 2y = 4$



$(2, 3)$

Eg 1

X-int: $\frac{7}{2}$

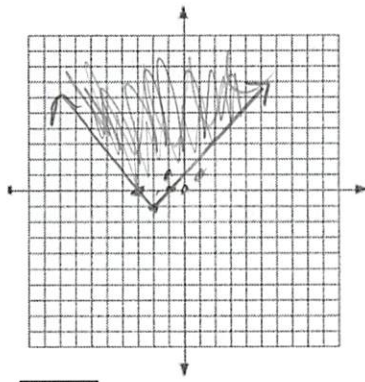
y-int: 7

Eg. 2

X-int: $\frac{4}{5}$

y-int: -2

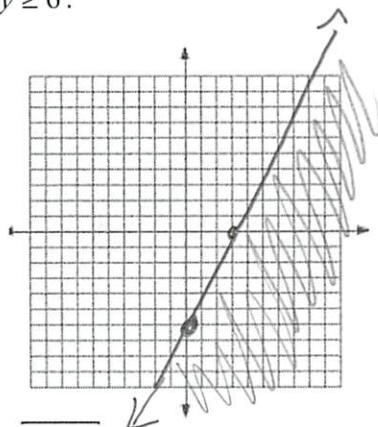
17. Graph the inequality $y \geq |x+2| - 1$.



$y = |x+2| - 1$
 p.f $y = |x|$

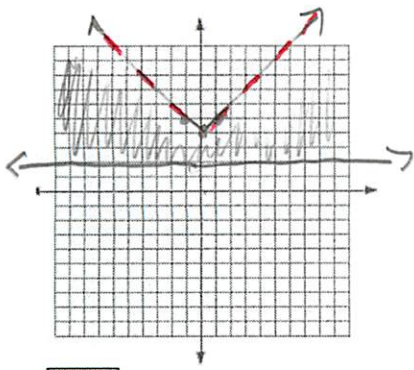
x	y
-1	1
0	0
1	1

18. Graph the inequality $2x - y \geq 6$.



x -int: 3
 y -int: -6

19. Graph the system of inequalities $y < |x| + 4$
 $y \geq 2$

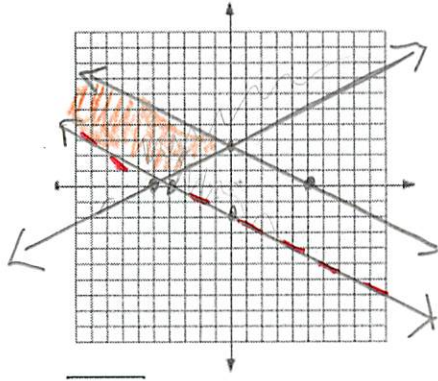


20. Graph the system of inequalities $2x - 4y \leq -10$.

Eg 1 $x + 2y \leq 5$

Eg 2 $2x - 4y \leq -10$

Eg 3 $3x + 6y > -12$



Eg 1
 x -int: 5
 y -int: $5/2$

Eg. 2
 x -int: -5
 y -int: $5/2$

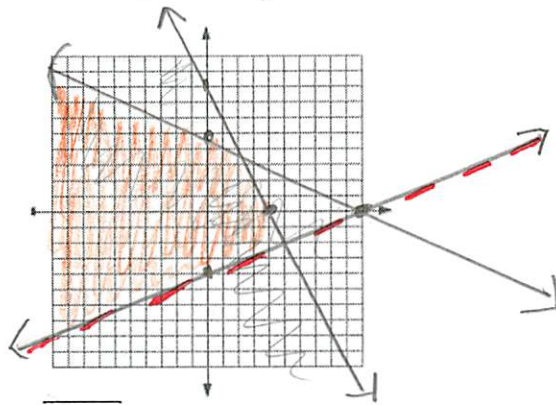
Eg. 3
 x -int: -4
 y -int: -2

21. Graph the system of inequalities $2x + y \leq 8$.

$x + 2y \leq 10$ Eg 1

$2x + y \leq 8$ Eg 2

$2x - 5y < 20$ Eg 3



Eg 1
 x -int: 10
 y -int: 5

Eg 2:
 x -int: 4
 y -int: 8

Eg. 3
 x -int: 10
 y -int: -4

22. Find the minimum and maximum values of the objective function $C = 3x + 5y$. Subject to the constraints $x \geq 0, y \geq 0, -3x + 6y \leq 18, x + y \leq 6$.

$$-3x + 6y \leq 18$$

$$x\text{-int: } -6$$

$$y\text{-int: } 3$$

$$C = 3x + 5y$$

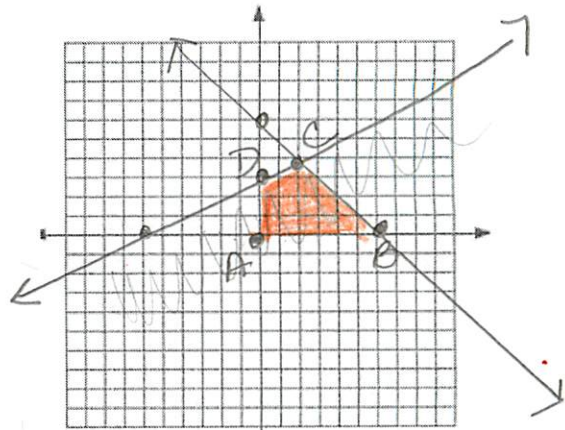
$$A (0, 0) = 0$$

$$B (6, 0) = 18$$

$$C (2, 4) = 26$$

$$D (0, 3) = 15$$

min is 0 at (0,0) and
max is 26 at (2,4).



To find vertex C

$$\begin{aligned} -3x + 6y &= 18 \\ -3x + 6y &= 18 \\ x + y &= 6 \Rightarrow *3 \end{aligned}$$

$$\begin{aligned} -3x + 6y &= 18 \\ -3x + 3y &= 18 \\ \hline 3y &= -36 \\ y &= -4 \end{aligned}$$

23. A student advisory board at your school must consist of 7 to 10 representatives from junior and senior classes. The board must include at least 3 juniors and 3 seniors. Write and graph a system of inequalities to describe the situation. Then give two solutions for the numbers of juniors and seniors on the board.

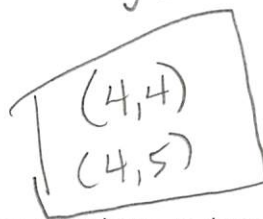
$$x + y \geq 7$$

$$x + y \leq 10$$

$$x \geq 3$$

$$y \geq 3$$

$x =$ junior rep
 $y =$ senior rep



24. You are decorating jewelry boxes to sell at a fair. It takes you 2 hours to decorate a small jewelry box and 3 hours to decorate a large jewelry box. You make a profit of \$12 for a small jewelry box and \$18 for a large jewelry box. If you have no more than 45 hours available and want at least 15 jewelry boxes to sell, how many of each size should you decorate to maximize your profit?

$$2x + 3y \leq 45$$

$$x + y \geq 15$$

$$\begin{aligned} x &\geq 0 \\ y &\geq 0 \end{aligned}$$

$x =$ small jewelry box
 $y =$ large jewelry box
 $P = 12x + 18y$

Unit IA Practice Test Key

① Solve $-10x + y = 40$
 $-5x + 3y = -5$

$$\boxed{(-5, -10)}$$

Substitution

$$y = 10x + 40$$

$$-5x + 3(10x + 40) = -5$$

$$-5x + 30x + 120 = -5$$

$$25x = -125$$

$$x = -5$$

so $y = 10(-5) + 40$

$$y = -50 + 40$$

$$y = -10$$

$$\boxed{(-5, -10)}$$

2. Solve $4x + 5y = -2$

$$5x = 5 - 10y \Rightarrow 5x + 10y = 5$$

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

Elimination

$$4x + 5y = -2 \Rightarrow 7 * by -2$$

$$5x + 10y = 5$$

$$5(-3) + 10y = 5$$

$$-15 + 10y = 5$$

$$10y = 20$$

$$y = 2$$

$$-8x - 10y = 4$$

$$5x + 10y = 5$$

$$\hline -3x = 9$$

$$x = -3$$

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

3. Solve $7x+3y=-9$ $\boxed{(-3, 4)}$
 $3y = x+15 \Rightarrow -x+3y=15$

Solve by elimination

$$\begin{array}{r} 7x+3y=-9 \\ -x+3y=15 \quad * -1 \end{array}$$

$$\begin{array}{r} 7x+3y=-9 \\ x-3y=-15 \\ \hline 8x=-24 \\ x=-3 \end{array}$$

$$\begin{array}{r} 7(-3)+3y=-9 \\ -21+3y=-9 \\ 3y=12 \\ y=4 \end{array}$$

$$\boxed{(3, 4)}$$

4. $4x-y=-7$ $y=4x+7$ $\boxed{(-2, -1)}$
 $-3x+2y=4$

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

$$-3x + 8x + 14 = 4$$

$$5x = -10$$

$$x = -2$$

$$y = 4(-2) + 7$$

$$y = -1$$

$$5. \quad \begin{cases} 4x + 3y = -1 \\ 9x + y = -8 \end{cases} \quad y = -9x - 8 \quad \boxed{(-1, 1)}$$

$$4x + 3(-9x - 8) = -1$$

$$\begin{aligned} 4x - 27x - 24 &= -1 \\ -23x &= 23 \\ x &= -1 \end{aligned}$$

$$\begin{aligned} y &= -9(-1) - 8 \\ y &= 9 - 8 \\ y &= 1 \end{aligned}$$

$$8. \quad \begin{cases} -2x + 3y = 8 \Rightarrow *3 \\ 3x + 5y = -12 \Rightarrow *2 \end{cases}$$

$$\begin{aligned} -6x + 9y &= 24 \\ 6x + 10y &= -24 \\ \hline 19y &= 0 \\ y &= 0 \end{aligned}$$

$$\begin{aligned} -2x + 3(0) &= 8 \\ -2x &= 8 \\ x &= -4 \end{aligned}$$

$$\boxed{(-4, 0)}$$

$$9. \quad \begin{cases} 6x + 5y = 11 \\ 4x - 2y = 34 \end{cases}$$

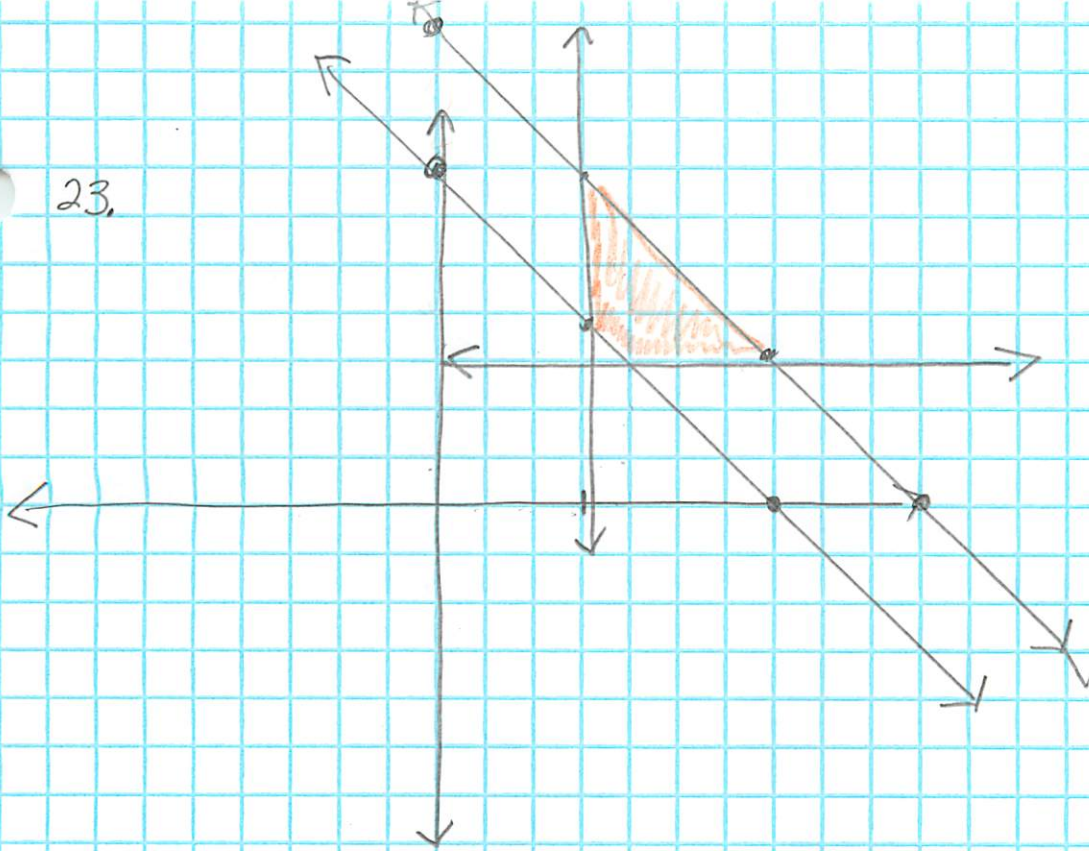
$$\begin{aligned} -2y &= -4x + 34 \\ -y &= -2x + 17 \\ y &= 2x - 17 \end{aligned}$$

$$\boxed{(6, -5)}$$

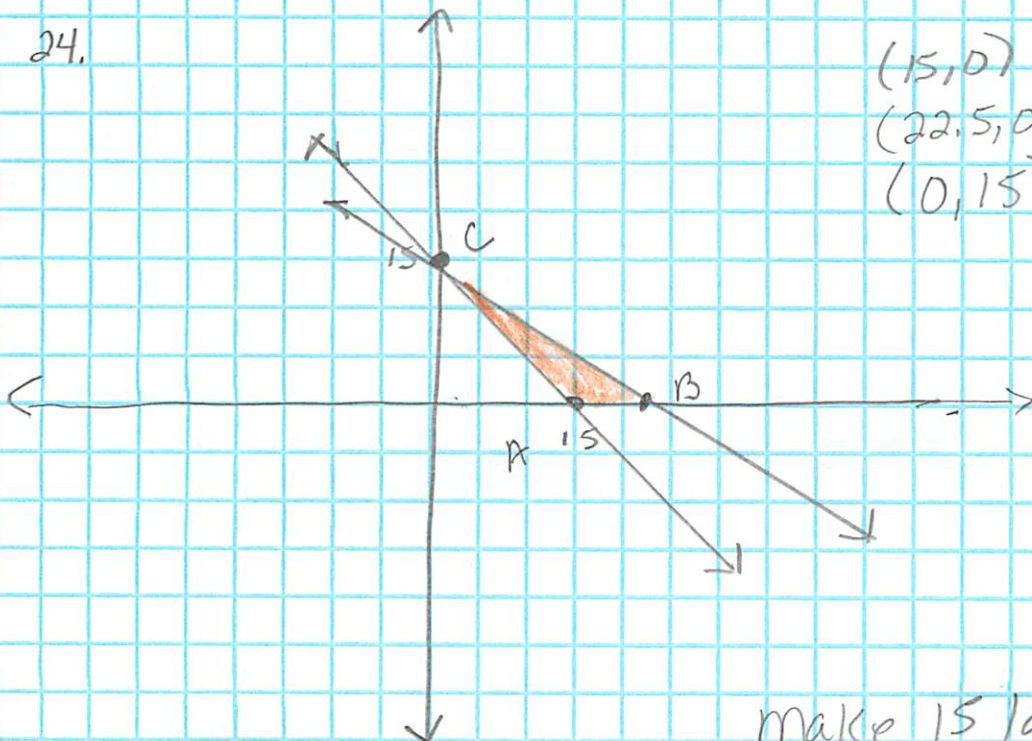
$$\begin{aligned} 6x + 5(2x - 17) &= 11 \\ 6x + 10x - 85 &= 11 \\ 16x &= 96 \\ x &= 6 \end{aligned}$$

$$\begin{aligned} y &= 2(6) - 17 \\ y &= -5 \end{aligned}$$

23.



24.



$$\begin{aligned}(15, 0) &= \$180 \\ (22.5, 0) &= 270 \\ (0, 15) &= 270\end{aligned}$$

make 15 large
jewelry boxes for
profit of \$270.00