

Name: KEY

Class: _____

Date: _____

ID: A

Uni 4 Exam Review 2017

Short Answer

Solve the system of equations using substitution.

$$\begin{aligned} 1. \quad y &= 2x + 3 \\ y &= 3x + 1 \end{aligned}$$

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

$$\begin{aligned} y &= 2(2) + 3 \\ &= 4 + 3 \end{aligned}$$

$$y = 7$$

$$(2, 7)$$

$$\begin{aligned} 2. \quad y &= 2x - 10 \\ y &= 4x - 8 \end{aligned}$$

$$\begin{array}{r} 2x - 10 = 4x - 8 \\ -2x \quad -2x \\ \hline -10 = 2x - 8 \\ +8 \quad +8 \\ \hline -2 = 2x \end{array}$$

$$\begin{aligned} y &= 2(-1) - 10 \\ &= -2 - 10 \end{aligned}$$

$$y = -12$$

$$(-1, -12)$$

Solve the system using elimination.

$$\begin{aligned} 3. \quad 2x - 2y &= -8 \\ 1x + 2y &= -1 \end{aligned}$$

$$\begin{array}{r} 2x - 2y = -8 \\ 1x + 2y = -1 \\ \hline 3x = -9 \end{array}$$

$$x = -3$$

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

$$\begin{aligned} 2y &= 2 \\ y &= 1 \end{aligned}$$

$$(-3, 1)$$

$$\begin{aligned} 4. \quad 3x - 4y &= -24 \\ 4x + 4y &= -4 \end{aligned}$$

$$\begin{array}{r} 3x - 4y = -24 \\ 4x + 4y = -4 \\ \hline 7x = -28 \end{array}$$

$$x = -4$$

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

$$(-4, 3)$$

$$\begin{aligned} 5. \quad -10x - 3y &= -18 \\ 27x + 8y &= 11 \end{aligned}$$

$$\begin{array}{r} 80x + 24y = 144 \\ -21x - 24y = 33 \\ \hline 59x = 177 \end{array}$$

$$\begin{array}{r} -10(3) - 3y = -18 \\ -30 - 3y = -18 \\ +30 \quad +30 \\ \hline -3y = 12 \end{array}$$

$$y = -4$$

$$(3, -4)$$

6. Tell whether the system has no solution, one solution, or infinitely many solutions.

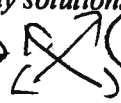
$$\begin{aligned} y &= -x - 5 \\ y &= -x - 3 \end{aligned}$$

same slope
different y-intercepts \rightarrow parallel lines
no solution

7. Tell whether the system has *no solution*, *one solution*, or *infinitely many solutions*

$$y = 2x - 3$$

$$y = 5x - 4$$

different slopes + y-int's \Rightarrow  **one solution**

8. Solve the system of equations.

$$3x + 2y = 7$$

$$y = -3x + 11$$

$$3x + 2(-3x + 11) = 7$$

$$3x - 6x + 22 = 7$$

$$-3x + 22 = 7$$

$$-3x - 22 = 7$$

$$\underline{-22 - 22}$$

$$-3x = -15$$

x = 5

$$y = -3(5) + 11$$

$$y = -15 + 11$$

y = -4

(5, -4)

9. Solve the system of equations.

$$5x + 2y = 13$$

$$-5x + 4y = 11$$

$$\Rightarrow \begin{array}{r} 5x + 2y = 13 \\ -5x + 4y = 11 \\ \hline -2y = 2 \end{array}$$

y = -1

$$5x + 2(-1) = 13$$

$$5x - 2 = 13$$

$$+2 + 2$$

$$\underline{5x = 15}$$

(3, -1)

10. By what number should you multiply the first equation to solve using elimination?

$$(-2)5x - 4y = -31$$

$$-15x + 3y = -33$$

-3

11. An ice skating arena charges an admission fee for each child plus a rental fee for each pair of ice skates. John paid the admission fees for his six nephews and rented five pairs of ice skates. He was charged \$32.00. Juanita paid the admission fees for her seven grandchildren and rented six pairs of ice skates. She was charged \$37.75. What is the admission fee? What is the rental fee for a pair of skates?

let x = admission fee John $6x + 5y = 32.00$
 rental fee Juanita $7x + 6y = 37.75$
 $\Rightarrow \begin{array}{r} 6x + 5y = 32.00 \\ -7x - 6y = -37.75 \\ \hline 13x + 11y = 69.75 \end{array}$

12. Mike and Kim invest \$20,000 in equipment to print yearbooks for schools. Each yearbook costs \$9 to print and sells for \$23. How many yearbooks must they sell before their business breaks even? The break even point is when the income equals the expenses.

(a) The equations are listed below. Which method would you use to solve this system--substitution or elimination?

Income: $y = 35x$
 Expenses: $y = 7x + 14,000$

Substitution - both in y = mx + b form

$x = 3.25$
 $6(3.25) + 5y = 32.00$
 $19.50 + 5y = 32.00$
 $5y = 12.50$
 $y = 2.50$

- (b) Solve the system.

$$35x = 7x + 14,000$$

$$\underline{-7x - 7x}$$

$$28x = 14,000$$

x = 500 yearbooks

13. Is (5, -2) a solution of the linear inequality?

$$y \geq 4x - 5$$

$$-2 \geq 4(5) - 5$$

$$-2 \geq 20 - 5$$

$$-2 \geq 15 \quad \underline{\text{no}}$$

Check: $(-3, 4)$

Is $(-3, 1)$ a solution of the system of linear inequalities?

14. $y < 3x + 12$
 $y \geq 5x + 7$

YES \rightarrow

$y < 3x + 12$	$y \geq 5x + 7$
$1 < 3(-3) + 12$	$1 \geq 5(-3) + 7$
$1 < -9 + 12$	$1 \geq -15 + 7$
$1 < 3$	$1 \geq -8$
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15. Write the following inequality in slope-intercept form.

$-15x - 3y \geq -12$
 $+15x \quad +15x$
 $\frac{-3y}{-3} \geq \frac{15x - 12}{-3}$

$y \leq -5x + 4$

16. The grocery store sells apples for \$4.50 a pound and bananas for \$4.00 a pound. Write an equation in standard form for the weights of apples a and bananas b that a customer could buy with \$16.

$4.50a + 4.00b = 16$

17. At the beginning of the year, you have a balance of \$350 in your bank account. Each month you deposit \$50.

(a) Write an equation for this situation.

$y = 50x + 350$

(b) Use the equation to find the balance in June.

$x = 6$

$y = 50(6) + 350 = 300 + 350 = 650$

Are the graphs of the lines in the pair parallel? Show work to back up your answer.

18. $y = -\frac{4}{5}x + 15$

$-8x - 10y = -14$
 $+8x \quad +10x$
 $-10y = 8x - 14$

Circle your answer: YES NO

$-10y = 8x - 14$
 $\frac{-10y}{-10} = \frac{8x - 14}{-10}$
 $y = -\frac{4}{5}x + \frac{7}{5}$

same slope
different y-intercepts

Write the equation of a line in slope-intercept form that is perpendicular to the given line and that passes through the given point.

19. $y = \frac{3}{5}x + 5; (9, -4)$

$m_{\perp} = -\frac{5}{3}$

$y + 4 = -\frac{5}{3}(x - 9)$ point-slope

$y + 4 = -\frac{5}{3}x + 15$
 $-4 \quad -4$

$y = -\frac{5}{3}x + 11$ slope-intercept

20. $x + 5y = 20; (-8, -7)$

$5y = -x + 20$
 $\frac{5y}{5} = \frac{-x + 20}{5}$

$y = -\frac{1}{5}x + 4$

$m_{\perp} = +5$

$y + 7 = 5(x + 8)$ point-slope

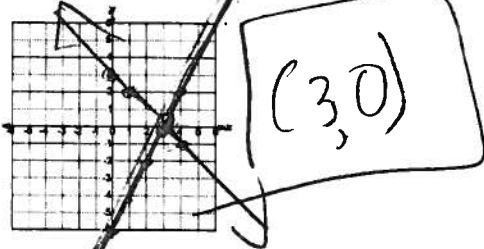
$y + 7 = 5x + 40$
 $-7 \quad -7$

$y = 5x + 33$ slope-int

21. Solve the below system of linear equations by graphing.

$y = -1x + 3$

$y = 2x - 6$

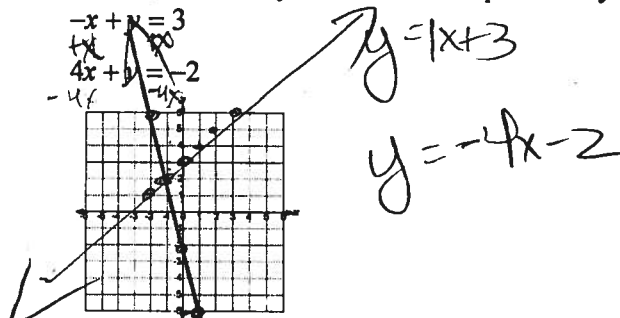


22. Solve the below system of linear equations by graphing.

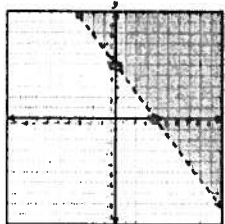
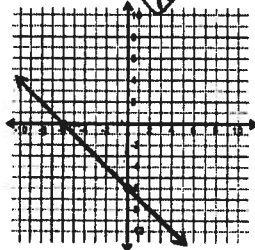
$-x + y = 3$

$4x + y = -2$

Solution: $(-1, 2)$



23. Write the inequalities from the graph below.



$y = mx + b$
 $b = -b$
 $m = \frac{-b}{b} = -1$

$y \leq -1x - 6$

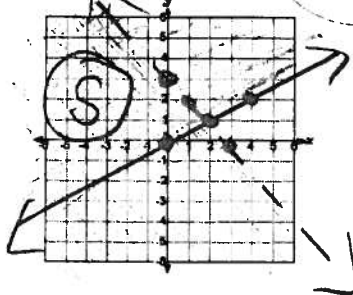
$y > \frac{5}{4}x + 5$

$b = 5$
 $m = \frac{-5}{4}$

24. Solve the following system of inequalities by graphing.

$x + y < 3$

$-2x + 4y \geq 0$



$y < -1x + 3$

$-2x + 4y \geq 0$
 $+2x$

$\frac{4y}{4} \geq \frac{2x+0}{4}$

$y \geq \frac{1}{2}x + 0$