Algebra I
Unit 6 Test 1 Review

Name: KEY
Date: _____ Period: _____

Remember to study your notes and old homework. Show all work to receive credit!!

Solve for y, compare slopes OR use calculator

#1-4: Determine the <u>number of</u> solutions to each system of equations (One, None, or Infinite)

1. $y = 2x + 2$
$-2x + y = 2$
$+2x \qquad +2x$

$\rightarrow y = 2x + 2$
$y = 2x + 2$
SAME LINE →
infinite solutions!

3. $y = -x - 5$
$y = -x + 4$

same slope →
parallel
NO solutions
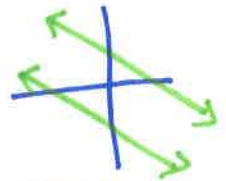
2. $y = \frac{1}{3}x + 17$
$8x - y - 6 = 0$
$y = 8x - 6$

$\rightarrow y = \frac{1}{3}x + 17$
$y = 8x - 6$
different slopes →
One solution

4. ① $3x - 9y = 12$
② $-x + 3y = -4$

① $3x - 9y = 12$
$-3x \qquad -3x$
$-9y = -3x + 12$
$\overline{-9} \quad \overline{-9} \quad \overline{-9}$
$y = \frac{1}{3}x - \frac{4}{3}$

② $+x + 3y = -4$
$+x \qquad +x$
$3y = x - 4$
$\overline{3} \quad \overline{3} \quad \overline{3}$
$y = \frac{1}{3}x - \frac{4}{3}$

same line →
infinite solutions

#5-8: Solve the following systems of equations. Write which method you used to solve.

5. $-2x + 2y = 6$
$2(3x - y = 3)$

Elimination
(eliminate y)

$-2x + 2y = 6$
$+ 6x - 2y = 6$
$\overline{4x = 12}$
$\overline{4} \quad \overline{4}$
$x = 3$

$-2(3) + 2y = 6$
$-6 + 2y = 6$
$+6 \qquad +6$
$\frac{2y}{2} = \frac{12}{2}$
$y = 6$

$(3, 6)$

7. $\frac{-3y}{-3} = \frac{-15}{-3}$, then $x + y = ?$
$x - 2y = -1$

substitution
solve TOP for
$y =$

$y = 5$
$x - 2(5) = -1$
$x - 10 = -1$
$+10 \quad +10$
$x = 9$

$x + y = 5 + 9 = 14$

6. $y = -\frac{2}{3}x + \frac{1}{3}$
$4x + 3y = 11$
$-4x \qquad -4x$
$\frac{3y}{3} = \frac{-4x + 11}{3} \quad \frac{}{3}$

Graphing
solve for y!
2nd TRACE
5: intersect
ENTER ×3

$y_1 = -\frac{2}{3}x + \frac{1}{3}$
$y_2 = -\frac{4}{3}x + \frac{11}{3}$

$(5, -3)$

8. $-5x + y = -2$
$-1(2x + y = 5)$, then $xy = ?$
$1 \cdot 3 = 3$

elimination
(eliminate y)

$-5x + y = -2$
$+ -2x - y = -5$
$\overline{-7x = -7}$
$\overline{-7} \quad \overline{-7}$
$x = 1$

$-5(1) + y = -2$
$-5 + y = -2$
$+5 \qquad +5$
$y = 3$

$(1, 3)$

#9-10: Is the point (-2,5) a solution to the following systems? Plug in x = -2 and y = 5

9. ① $2x - y = -9$
② $-x - 2y = -8$

① $2(-2) - 5 \overset{?}{=} -9$
$-4 - 5 = -9$
$-9 = -9 \checkmark$

② $-(-2) - 2(5) \overset{?}{=} -8$
$2 - 10 = -8$
$-8 = -8 \checkmark$

Yes!

10. ① $y = -2x + 1$
② $2x + y = 10$

① $5 \overset{?}{=} -2(-2) + 1$
$5 = 4 + 1$
$5 = 5 \checkmark$

② $2(-2) + 5 \overset{?}{=} 10$
$-4 + 5 = 10$
$1 \neq 10$

NO!

REMEMBER: use whichever method you feel most comfortable with

11. Write the equation that represents each table. What is the solution to the system of equations?

x	y
-3	0
-1	1
1	2
2	2.5

x	y
-1	1
0	-2
3	-11
5	-17

y= $\frac{1}{2}x + \frac{3}{2}$

y= $-3x - 2$

Solution: $(-1, 1)$

12. The equations of two lines are $6x - y = 4$ and $y = 4x + 2$. What is the value of x in the solution for this system of equations? **substitution**

$6x - y = 4$
$y = \boxed{4x + 2}$

$6x - (4x + 2) = 4$
$6x - 4x - 2 = 4$
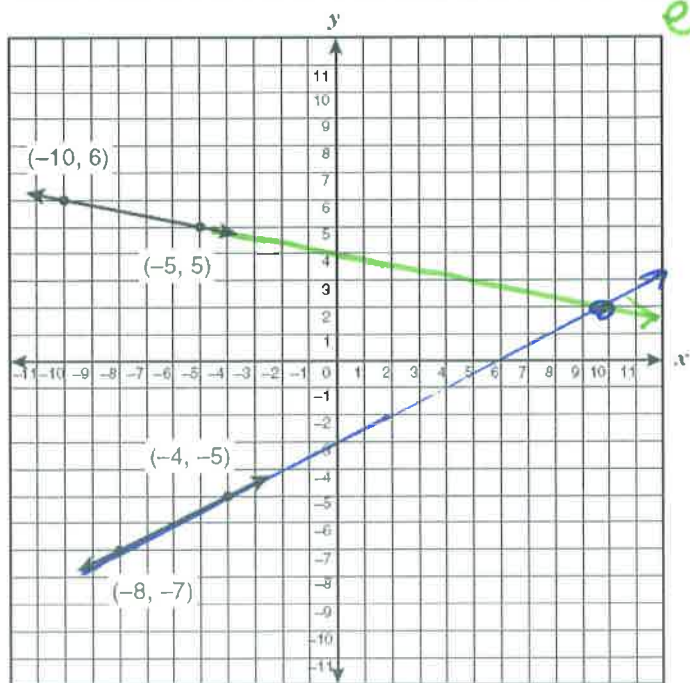$2x - 2 = 4$
$ +2 +2$
$\frac{2x}{2} = \frac{6}{2}$
$x = 3$

$\boxed{3}$

13. What is the solution to the following system of equations?

extend the lines with a straight edge!

(−10, 6)
(−5, 5)
(−4, −5)
(−8, −7)

$\boxed{(10, 2)}$

intersection of lines → solution to system

14. In the system of equations $4x + 5y = 8$ and $\boxed{2x - 3y = 18}$, which expression can be correctly substituted for y in the equation $4x + 5y = 8$? **solve for y**

$2x - 3y = 18$
$-2x -2x$
$\frac{-3y = -2x + 18}{-3} \frac{}{-3} \frac{}{-3}$
$y = \frac{2}{3}x - 6$

A. $-\frac{2}{3}x + 6$

B. $\frac{2}{3}x - 6$

C. $-\frac{2}{3}x - 6$

D. $\frac{2}{3}x + 6$

solve for y

15. Which of the following representations accurately describes the following system of equations?

$$\begin{cases} 3x + y = -6 \\ 5x + y = -10 \end{cases}$$

I. $\quad y = -3x - 6$ ✓
$\quad\quad y = -5x - 10$ ✓

II.

X	Y1	Y2	
-3	3	5	✓
-2	0	0	✓
-1	-3	-5	✓
0	-6	-10	✓
1	-9	-15	✓

~~III.~~
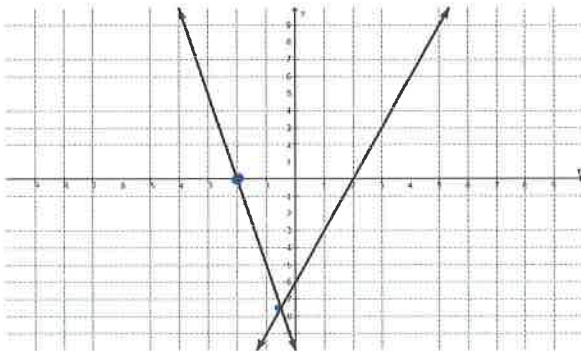
16. Graph the systems of equations on the graph below. Then label the solution on the graph and record your answer. **solve for y to use your calculator**

① $\quad x - 3y = 6$

② $\quad 4x + 2y = 24$

SOLUTION: $(6, 0)$

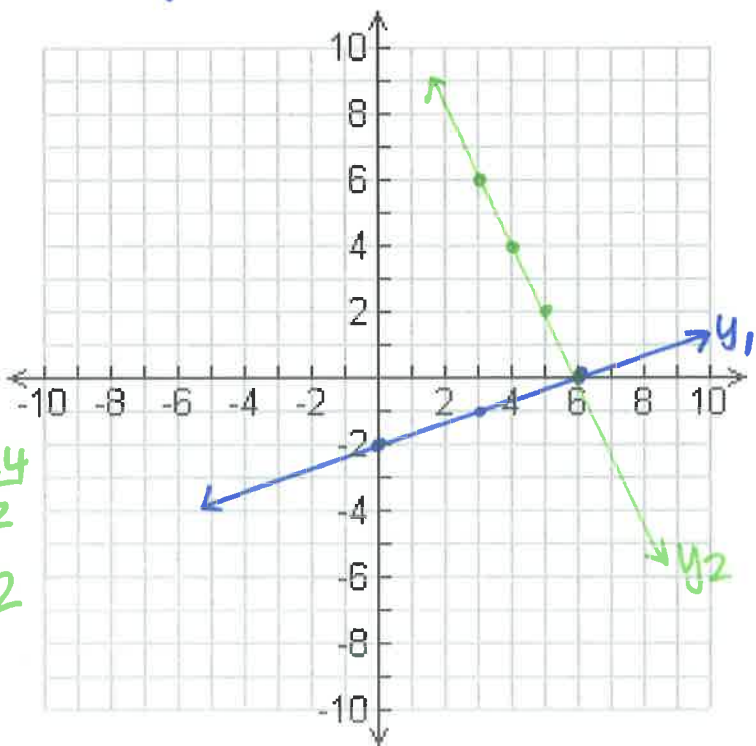① $x - 3y = 6$
$\quad -x \quad\quad -x$
$\quad \dfrac{-3y}{-3} = \dfrac{-x}{-3} + \dfrac{6}{-3}$
$\quad y_1 = \dfrac{1}{3}x - 2$

② $4x + 2y = 24$
$\quad -4x \quad\quad -4x$
$\quad \dfrac{2y}{2} = \dfrac{-4x}{2} + \dfrac{24}{2}$
$\quad y_2 = -2x + 12$

Write a system of equations. Don't forget "Let statements"

17. One number is 8 more than 3 times another number. Their sum is 86. Write a system of equations to find the two numbers.

Let 1st # be x
Let 2nd # be y.

$x = 8 + 3y$
$x + y = 86$

18. Maggie's coin collection consists of dimes and quarters. If she has 53 coins worth $7.85, write a system of equations to determine how many dimes and quarters she has.

Let dimes be d.
Let quarters be q.

\# $d + q = 53$
\$ $.10d + .25q = 7.85$

19. Adult movie tickets cost $8 and kids' tickets cost $5. At a particular movie there were 125 tickets sold for $850. Write a system of equations to determine how many of each type of ticket were sold.

Let adult tickets be a.
Let kids tickets be k.

\# $a + k = 125$
\$ $8a + 5k = 850$

20. Some students want to order t-shirts for Carousel. One company charges $9.65 per shirt plus a setup fee of $43. Another company charges $8.40 per shirt plus a $58 fee. Write a system of equations to determine for what number of shirts will have the same cost at both companies.

Let cost be y.
Let shirts be x.

① $y = 9.65x + 43$
② $y = 8.40x + 58$

21. Kelly will enclose her rectangular tomato garden with 32 feet of fencing. The length of the garden, l, is 3 times the width, w. Which system of equations can be used to find the dimensions of her garden?

A. $l + w = 32$
   $w = 3l$

B. $2l + 2w = 32$
   $w = 3l$

C. $l + w = 32$
   $l = 3w$

D. $2l + 2w = 32$
   $l = 3w$

$l = 3w$ substitution!

$2(3w) + 2w = 32$
$8w = 32$
$w = 4$ $l = 12$

22. Mindy and Jasmine went to a store to buy DVD's on sale for $5 each, tax included. Mindy purchased two and half times as many DVD's as Jasmine purchased. Together they purchased 14 DVD's. Which system of linear equations can be used to determine m, the number of DVD's Mindy purchased and j, the number of DVD's Jasmine purchased?

A. $m + j = 14$
   $m = \frac{1}{2} j$

B. $m + j = 14$
   $m = \frac{5}{2} j$

C. $5m + 5j = 14$
   $j = \frac{1}{2} m$

D. $m + j = 14$
   $j = \frac{5}{2} m$