

Unit 4 Test 1 Review

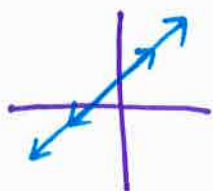
Name: Key

Date: _____ Period: _____

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

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

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



SAME LINE!

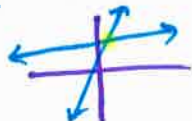
Infinite

2. $y = \frac{1}{3}x + 17$

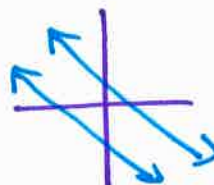
$8x - y - 6 = 0$
 $-8x \quad +6 \quad -8x + 6$

$-y = -8x + 6$
 $-1 \quad -1 \quad -1$

$y = 8x - 6$

**ONE**

3. $y_1 = -x - 5$
 $y_2 = -x + 4$

**NONE**

4. $3x - 9y = 12$
 $-x + 3y = -4$

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

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

**Infinite**

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

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

x's & y's lined up →
matrix or elimination

$\begin{bmatrix} -2 & 2 \\ 3 & -1 \end{bmatrix}^{-1} \begin{bmatrix} 6 \\ 3 \end{bmatrix}$
(3, 6)

$0x - 3y = -15$, then $x + y = ?$
 $x - 2y = -1$

substitution
(solve for y)
or matrix

$\begin{bmatrix} 0 & -3 \\ 1 & -2 \end{bmatrix}^{-1} \begin{bmatrix} -15 \\ -1 \end{bmatrix}$
(9, 6)

$9 + 6 = \mathbf{15}$

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

Solve 2nd for y →
graphing

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

(5, -3)



8. $-5x + y = -2$
 $2x + y = 5$, then $xy = ?$

matrix or
elimination

$\begin{bmatrix} -5 & 1 \\ 2 & 1 \end{bmatrix}^{-1} \begin{bmatrix} -2 \\ 5 \end{bmatrix}$
(1, 3)

$(1)(3) = \mathbf{3}$

#9-10: Is the point (-2, 5) a solution to the following systems?Plug in (x, y) 2 ✓'s → YES
1 x → NO

① $2x - y = -9$
 ② $-x - 2y = -8$

YES

① $2(-2) - 5 = -9?$
 $-4 - 5 = -9 \checkmark$
 ② $-(-2) - 2(5) = -8?$
 $2 - 10 = -8 \checkmark$

① $y = -2x + 1$
 ② $2x + y = 10$

NO

① $5 = -2(-2) + 1?$
 $5 = 4 + 1 \checkmark$
 ② $2(-2) + 5 = 10?$
 $-4 + 5 = 10 \times$

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

STAT 1:Edit...

X'S → L1
Y'S → L2

STAT 4:LinReg

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

$y = .5x + 1.5$

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

$y = -3x + 2$

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?

$6x - y = 4$

$y = 4x + 2$

substitution

$6x - 1(4x + 2) = 4$

$6x - 4x - 2 = 4$

$2x - 2 = 4$

$2x = 6$

$x = 3$

13. In the system of equations $4x + 5y = 8$ and $2x - 3y = 18$, which expression can be correctly substituted for y in the equation $4x + 5y = 8$?

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

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

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

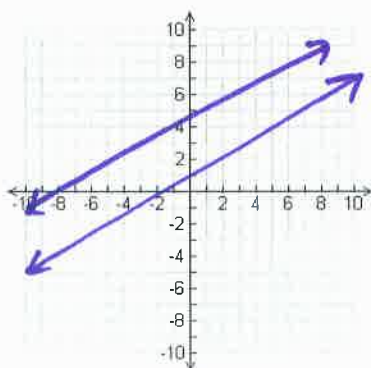
D. $\frac{2}{3}x + 6$

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

14. Sketch a system of equations that display the following number of solutions.

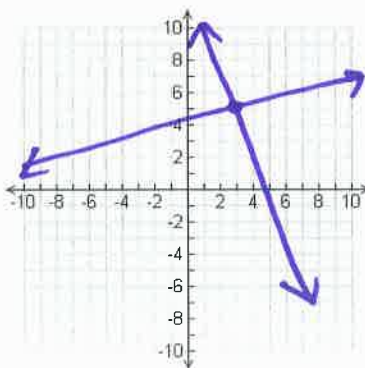
a. No solutions

never touch



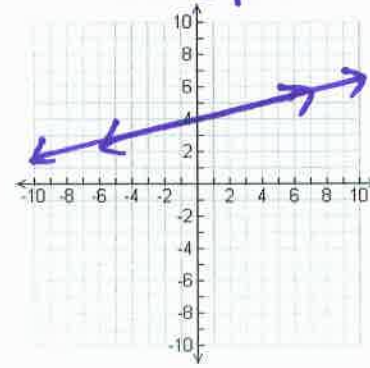
b. One solution

touch once



c. Infinite solutions

same line → always touch



Write a system of equations for the following.

15. 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 x be one number.
Let y be the other.

$$\begin{aligned}x + y &= 86 \\x &= 8 + 3y\end{aligned}$$

total \$ special rule

16. 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 d be dimes.
Let q be quarters.

$$\begin{aligned}\$ \$ \quad 0.10d + 0.25q &= 7.85 \\# \quad d + q &= 53\end{aligned}$$

dime = 0.10
quarter = 0.25

Solve the following systems of equations. write system FIRST.

17. 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 A be adult tickets.
Let K be kids' tickets

$$\begin{aligned}\$ \$ \quad 8A + 5K &= 850 \\# \quad A + K &= 125\end{aligned}$$

$$\begin{bmatrix} 8 & 5 \\ 1 & 1 \end{bmatrix}^{-1} \begin{bmatrix} 850 \\ 125 \end{bmatrix}$$

$A = 75$ adult tickets
 $K = 50$ kids tickets

18. Some students want to order t-shirts for Carousell. 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 y be cost.
Let x be shirts.

$$\begin{aligned}\text{1st company: } y_1 &= 9.65x + 43 \\ \text{2nd company: } y_2 &= 8.40x + 58\end{aligned}$$

(12, 158.8)

12 shirts
\$158.80

19. 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?

w = width
 L = length

$$\begin{aligned}l + w &= 32 \\w &= 3l\end{aligned}$$

$$\begin{aligned}2l + 2w &= 32 \\w &= 3l\end{aligned}$$

B.

$$\begin{aligned}l + w &= 32 \\l &= 3w\end{aligned}$$

X

$$\begin{aligned}2l + 2w &= 32 \\l &= 3w\end{aligned}$$

D.

$L = 3W$



20. Use your answer choice from #19 to find the length of Kelly's garden.

SUBSTITUTION

$$\begin{aligned}2(3w) + 2w &= 32 \\6w + 2w &= 32 \\8w &= 32 \\w &= 4\end{aligned}$$

$L = 3(4)$
12 feet
length

MATRIX

$$\begin{aligned}2L + 2W &= 32 \\L - 3W &= 0\end{aligned}$$

$$\begin{bmatrix} 2 & 2 \\ 1 & -3 \end{bmatrix}^{-1} \begin{bmatrix} 32 \\ 0 \end{bmatrix}$$

perimeter:
 $2L + 2W = 32$