

TOPIC 3 POSTTEST

First and Last Name _____

Teacher _____ **Block** _____

This test will help us learn how you think about algebra topics from Topic 3: Solving Systems of Linear Equations. Please do your best to circle an answer for all the questions.

If you don't know an answer, you may guess or write "I don't know". Please don't leave any questions blank – we want to know how much you had time to try.

If you make a mistake, please lightly cross out the work, but do not erase it. You may NOT use a calculator.

Only work forwards in the test booklet. Do not go back to a page that you've already looked at, even if you have extra time. You have 45 minutes to answer all the questions.

Thank you for doing your best work!

This page is blank on purpose!

What is today's date? _____

1) Choose the definition that best describes the solution to a system of equations.

- a. Any point that makes one of the equations true.
- b. Any point that makes both equations true.
- c. Any point that lies on the graph of both equations.
- d. Both a and b
- e. Both b and c

2) Pete wants to solve the system of equations $\begin{cases} 6x + y = 4 \\ x - 4y = 19 \end{cases}$ by using *substitution*. Pete thinks he will get the same solution regardless of whether he starts by solving the first equation for y or whether he starts by solving the second equation for x . Is Pete's thinking correct? Why or why not? Circle the letter for your answer.

- a. Pete's thinking is wrong because these two methods will give two different solutions for this system of equations.
- b. Pete's thinking is wrong because solving the first equation for y first is the only correct way to solve this system of equations by substitution.
- c. Pete's thinking is correct because either way he starts solving this system, he will get the same correct solution.
- d. Pete's thinking is correct because even though he gets two different solutions, they will both be correct for different reasons.

3) Which of the following equations completes the system of equations $\begin{cases} y = 3x + 2 \\ \end{cases}$ so that it has no solution?

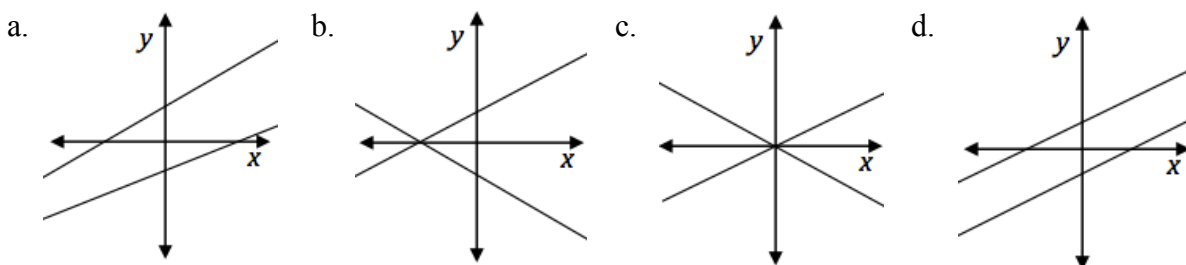
- a. $y = 6x + 4$
- b. $y = 3x + \frac{1}{2}$
- c. $y = -\frac{1}{3}x + 2$
- d. $y = 2x + 3$

4) Given the system of equations $\begin{cases} y = x + 1 \\ 2y = 3x + 4 \end{cases}$, why can we add $2y$ to one side of the equation

$y = x + 1$ and $3x + 4$ to the other side?

- Because you can combine like terms.
- Because you can add anything to both sides of an equation to make a new equation.
- Because the equation $2y = 3x + 4$ tells me that $2y$ has the same value as $3x + 4$.
- Because the equation $y = x + 1$ tells me that y has the same value as $x + 1$.

5) Which of the following graphs could represent a system of equations with no solution?



6) Sarah is solving the system of equations $\begin{cases} 5x + 6y = 10 \\ x + 2y = 7 \end{cases}$ using elimination. As a first step, how could she rewrite the second equation so that she can use the elimination method?

- $-5x - 10y = -35$
- $-5x - 6y = -35$
- $-5x - 10y = 7$
- $x - 6y = -21$

7) Which of the following shows the result of substituting the second equation into the first equation for the system of equations $\begin{cases} 3x + y = 5 \\ y = -4x - 3 \end{cases}$?

- a. $3x - 4x + 3 = 5$
- b. $3x - 4x - 3 = 5$
- c. $3(-4x - 3) + y = 5$
- d. $5 - 3x = -4x - 3$

8) Solve the system below and write your answer in the blank.

$$\begin{cases} x + 2y = 6 \\ 3x + 8y = 4 \end{cases}$$

Answer _____

9) If $x + y = 12$ and $2x + 5y = 36$, what are the values of x and y ?

- a. (2, 10)
- b. (4, 8)
- c. (9, 3)
- d. (8, 4)

10) Find the solution to the system of equations $\begin{cases} x + 2y = 3 \\ 2x + 4y = 6 \end{cases}$.

- a. Infinitely many solutions
- b. (0, 0)
- c. No solution
- d. (9, 6)

11) Gabriella solved the following problem:

$$\begin{cases} x + 2y = 9 \\ 3x - 2y = 11 \end{cases}$$

This is how Gabriella started the problem:

$$\begin{aligned} x + 2y &= 9 \\ 2y &= 9 - x \\ y &= \frac{9 - x}{2} \end{aligned}$$

11a. Which of the following describes Gabriella's approach?

- a. Add the first equation and the second equation together.
- b. Solve the first equation for y .
- c. Multiply both sides of the first equation by 3.
- d. Solve the first equation for x .

11b. Do you think this is a good way to start this problem? **Circle one:**

- a. Very good way
- b. May be used, but not a very good way
- c. May not be used

12) Below is the beginning of Gabriella's, Jamal's, and Nadia's work in solving the system of

equations $\begin{cases} 2x + 3y = 6 \\ -2x - 6y = 12 \end{cases}$. To start solving this problem, which way(s) may be used?

- a. Gabriella's way
- b. Jamal's way
- c. Nadia's way
- d. Gabriella's and Nadia's ways
- e. Gabriella's, Jamal's, and Nadia's ways

| Gabriella's way: | Jamal's way: | Nadia's way: |
|---|--|---|
| $\begin{array}{r} 2x + 3y = 6 \\ -2x - 6y = 12 \\ \hline \dots \end{array}$ | $\begin{array}{r} 2(2x + 3y = 6) \\ 4x + 6y = 12 \\ -2x - 6y = 12 \\ \hline \dots \end{array}$ | $\begin{array}{r} 6 \cdot (2x + 3y = 6) \\ 3 \cdot (-2x - 6y = 12) \\ \hline \dots \end{array}$ |

For questions 13-14, **imagine you are taking a timed test.** *You want to use fast (and correct) ways to solve the problems so you can finish as many as possible. Circle the letter for the best way to approach each problem.*

13) On a timed test, which would be the BEST way to start solving this system of equations?

$$\begin{cases} 4x - 3y = 11 \\ 5x + y = 19 \end{cases}$$

| a. Gabriella's way: | b. Jamal's way: | c. Nadia's way: |
|--|---|---|
| $\begin{array}{r} 5x + y = 19 \\ y = 19 - 5x \\ \dots \end{array}$ | $\begin{array}{r} 5 \cdot (4x - 3y = 11) \\ -4 \cdot (5x + y = 19) \\ \hline \dots \end{array}$ | $\begin{array}{r} 4x - 3y = 11 \\ x = \frac{3y + 11}{4} \\ \dots \end{array}$ |

14) On a timed test, which would be the BEST way to start solving this system of equations?

$$\begin{cases} 3x + 2y = 8 \\ x = 6 + y \end{cases}$$

| | | |
|---|--|--|
| <p>a. Gabriella's way:</p> $x = 6 + y$ $y = x - 6$ $3x + 2(x - 6) = 8$ <p>...</p> | <p>b. Jamal's way:</p> $x = 6 + y$ $3(6 + y) + 2y = 8$ $18 + 3y + 2y = 8$ <p>...</p> | <p>c. Nadia's way:</p> $3x + 2y = 8$ $\frac{-3 \cdot (x - y = 6)}{2y + 3y = -10}$ <p>...</p> |
|---|--|--|

15) Below is the beginning of Jamal's solution to the system of equations

$$\begin{cases} 6x - 5y = -1 \\ -6x + 4y = -10 \end{cases}$$

$$6x = -1 + 5y$$

$$x = \frac{-1 + 5y}{6}$$

$$6\left(\frac{-1 + 5y}{6}\right) + 4y = -10$$

Solve this system of equations using a **different** way that is **easier** and **faster** than Jamal's way.

For number 15, please use the space provided on your answer sheet to show all your work and write your answer.