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Unit 5: Systems of Equations Review Sheet HONORS

For exercises #1-2, you may only use each method once.

1. Solve the following system of equations using the appropriate method.

$$y = 4x - 3$$
$$y = -2x + 15$$

(3, 9)

Circle your method: Substitution Elimination Graphing

2. Solve the following system of equations using the appropriate method.

(−4, 7)

$$5x + 2y = -6$$
$$+\ 3x - 2y = -26$$
$$8x = -32$$
$$x = -4$$

$5(-4) + 2y = -6$

$-20 + 2y = -6$

$2y = 14$

$y = 7$

Circle your method: Substitution Elimination Graphing

3. Which of the following points would be a solution for the system of inequalities?

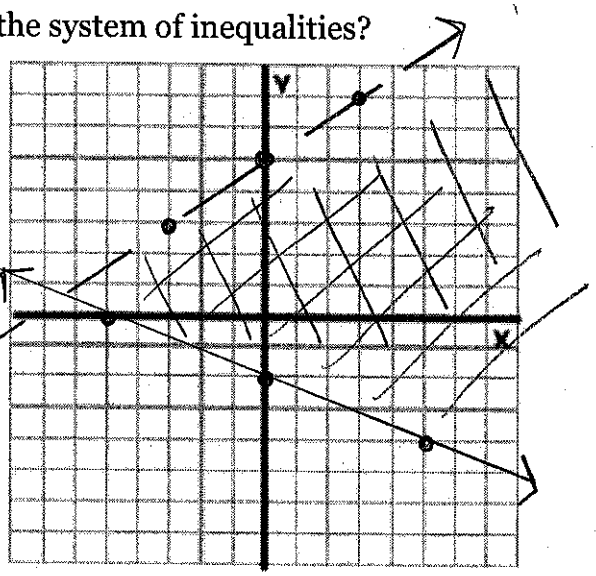
$$y < \frac{2}{3}x + 5$$
$$2x + 5y \geq -10$$

$2x + 5y \geq -10$

$-2x \quad -2x$

$5y \geq -2x - 10$

$y \geq -\frac{2}{5}x - 2$



A. (−3, −7)

B. (−8, 1)

C. (5, 3)

D. (8, −10)

4. Solve the following system of equations to find the value of y.

$y = -8$

$$2(7x + 3y = 11) \quad 14x + 6y = 22$$
$$7(2x + 9y = -62) \quad 14x + 63y = -434$$
$$-57y = 456$$
$$y = -8$$

Circle your method: Substitution Elimination Graphing

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5. Solve the following system of equations using the appropriate method.

NO SOL. $y = -\frac{2}{3}x + 2$

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

$2x + 3y = 6$

$-2x \quad -2x$

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

Circle your method: Substitution Elimination Graphing

6. What is the solution to the system of equations below?

$7x + 8y = 38$

$5x + 9y = 37$

$7x + 8(3) = 38$

$7x + 24 = 38$

$7x = 14$

$x = 2$

(2, 3)

$5(7x + 8y = 38)$

$7(5x + 9y = 37)$

$35x + 40y = 190$

$(-)\ 35x + 63y = 259$

$-23y = -69$

$\frac{-23y}{-23} = \frac{-69}{-23}$

7. Which point is NOT a solution to the system of inequalities below?

$2x - y \geq 0$

$-2x \quad -2x$

$\frac{-y}{-1} \geq \frac{-2x}{-1}$

$y \leq 2x$

$2x - y \geq 0$

$3x + y < 5$

$y < -3x + 5$

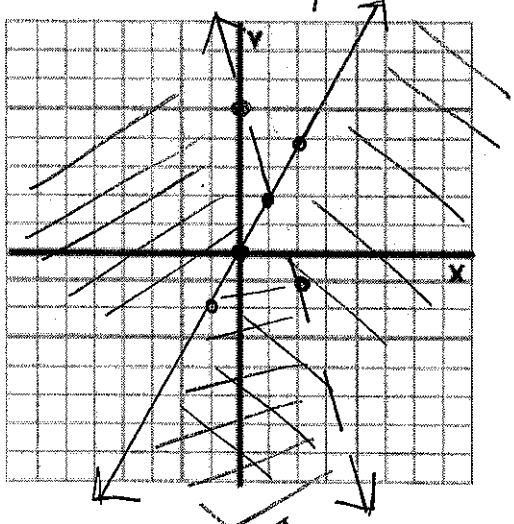
A. (1, −6)

B. (1, −2)

C. (2, −1) → on dotted line

D. (3, −7)

$y = 3$



8. A region is defined by the system:

$4x - y < -2$

$6x + 2y \leq -10$

In which quadrants of the coordinate plane is the region located?

A. *I, II, III only*

B. *II and III only*

C. *III and IV only*

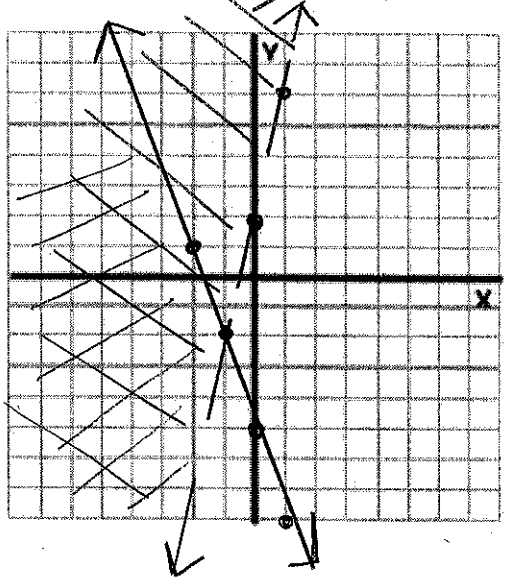
D. *I, II, III, and IV*

$4x - y < -2$

$-4x \quad -4x$

$\frac{-y}{-1} < \frac{-4x - 2}{-1}$

$y > 4x + 2$



$6x + 2y \leq -10$

$-6x \quad -6x$

$\frac{2y}{2} \leq \frac{-6x - 10}{2}$

$y \leq -3x - 5$

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9. Given the system of equations below, what is the solution?

$10x+40y=30$
$10x+40y=30$

Inf. sol.

$5(2x+8y=6)$
$2(5x+20y=15)$

10. Given the system of equations below:

$3(x-3y=-13)$
$3x+7y=25$

What is the value of $x+y$?

$x+y=3$

$x-3(4)=-13$
$x-12=-13$
$x=-1$

$3x-9y=-39$ (−)
$3x+7y=25$

$-16y=-64$
$-16 \quad -16$
$y=4$

11. Given the system of equations below:

$(+)\ 3x-5y=22$
$-3x+4y=-20$

What is the value of $x+y$?

$x+y=2$

$-y=2$
$-1 \quad -1$
$y=-2$

$3x-5(-2)=22$
$3x+10=22$
$3x=12$
$x=4$

12. What is the value of y for the system of equations below?

$2x+3(5x-27)=4$
$2x+15x-81=4$
$17x-81=4$
$17x=85$
$x=5$

$2x+3y=4$
$y=5x-27$

$y=5(5)-27$
$y=25-27$
$y=-2$

$y=-2$

13. Solve the system of equations below.

$3x+6y=27$
$3(x+2y=11)$

No sol.

$3x+6y=27$
$3x+6y=33$

14. Which system of equations has exactly one solution?

A. $y=x-1$ and $2x-3y=-1$

B. $y=4x-16$ and $4x-y=-5$ ⟶

$4x-y=-5$
$-4x \quad -4x$

$-y=-4x-5$
$-1 \quad -1 \quad -1$
$y=4x+5$

same slope = ∅

C. $x+3y=5$ and $6x+18y=30$

$6(x+3y=5)$
$6x+18y=30$

Inf. sol.

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15. A system of equations is shown below.

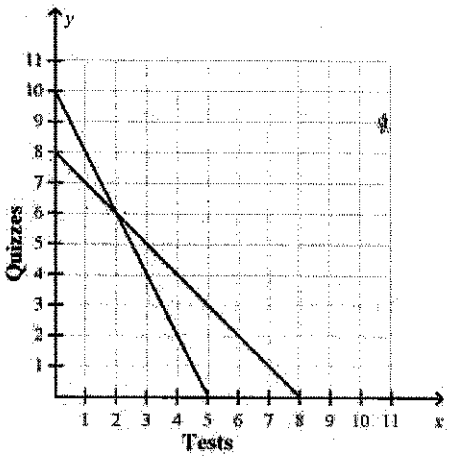
$$3x - y = 5$$
$$x - 2y = -9$$

Which operations on the system of equations could be used to eliminate the x variable?

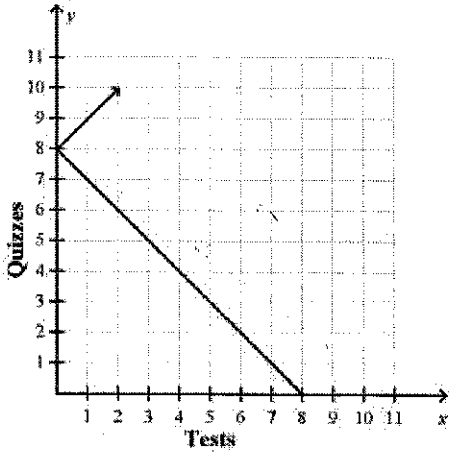
A. Divide the first equation by 3 and add the result to the first equation
B. Divide the first equation by −2 and add the result to the first equation
C. Multiply the second equation by 2 and add the result to the first equation
D. Multiply the second equation by −3 and add the result to the first equation

16. Your science class has eight assessments. Tests are worth 100 points, and quizzes are worth 50 points. There were 500 points possible in the quarter. Which graph below represents the number of tests and quizzes you had last quarter?

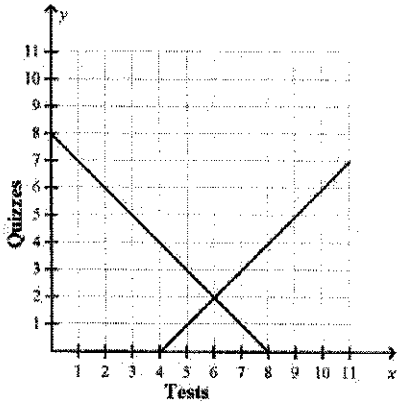
a.



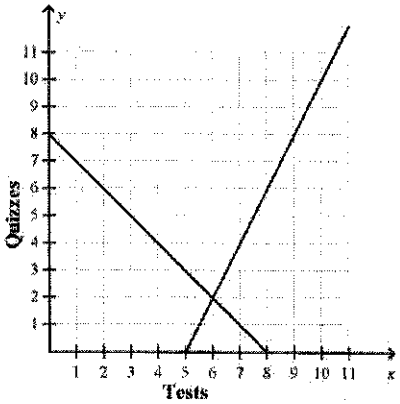
c.



b.



d.



X = tests

Y = quizzes

$X + Y = 8 \rightarrow Y = -X + 8$

$100X + 50Y = 500$

$-100X \quad -100X$

$\frac{50Y}{50} = \frac{-100X}{50} + \frac{500}{50} \rightarrow Y = -2X + 10$

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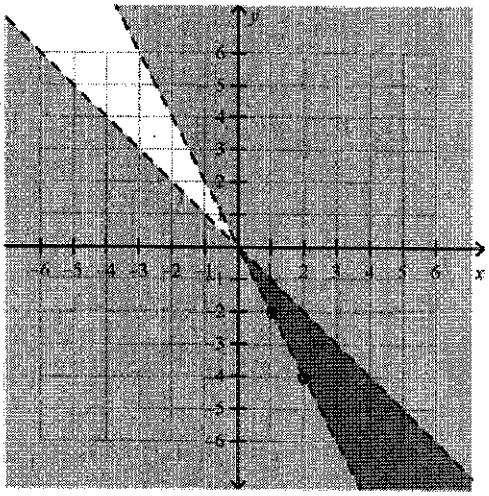
Unit 5: Systems of Equations Review Sheet HONORS

17. Which system of inequalities is represented by the graph below?



a. $\begin{cases} y \geq -2x \\ y \leq -x \end{cases}$

b. $\begin{cases} y > -2x \\ y < -x \end{cases}$

c. $\begin{cases} y < -2x \\ y > -x \end{cases}$

d. $\begin{cases} y > -x \\ y < -2x \end{cases}$

For exercises 18-23, define the variables, write the system of equations, and clearly identify your solution.

18. A collection of dimes and nickels is worth \$3.15. There are 39 coins in all. How many dimes and nickels are there?

X= dimes
y= nickels

$X+y=39 \longrightarrow y=-X+39$

$.10X+.05y=3.15$

$.10X+.05(-X+39)=3.15$

$.10X-.05X+1.95=3.15$

$.05X=1.20$

$X=24$

$y=15$

24 dimes
15 nickels

19. Ann invested \$12,000 in two bank accounts. One of the accounts pays 6% annual interest, and the other account pays 5% annual interest. If the combined interest earned in both accounts after a year was \$700, how much money was invested in each account?

X= 6% int
y= 5% int
↳$ invested

$X+y=12{,}000 \longrightarrow y=-X+12{,}000$

$.06X+.05y=700$

$.06X+.05(-X+12000)=700$

$.06X-.05X+600=700$

$.01X=100$

$X=\$10{,}000$

$y=\$2{,}000$

20. Tickets to the fashion show are \$4.50 for adults and \$2.50 for students. The total sales were \$608.50 for 185 tickets. How many adults and student attended the fashion show?

X= adults
y= students

$X+y=185$

$4.50X+2.50y=608.50$

$(-)\ 4.50X+4.50y=832.50$

$4.50X+2.50y=608.50$

$2y=224 \quad y=112$

112 students
73 adults

21. The sum of two numbers is 36. The sum of the greater number and twice the smaller is 18. Find the GREATER number.

X= smaller #
y= larger #

$X+y=36$

$(-)\ 2X+y=18$

$-X=18$

$X=-18$

$y=54$

22. A tennis coach took his team out for lunch and bought 8 hamburgers and 5 fries for \$24. The players were still hungry so the coach bought 6 more hamburgers and 2 more fries for \$16.60. How much would 1 hamburger and 1 order of fries cost?

X= burgers
y= fries

$8X+5y=24 \longrightarrow 10X+10y=48$

$6X+2y=16.60 \longrightarrow (-)\ 30X+10y=83$

$-14X=-35$

$X+y$

$X=2.50$

$8(2.50)+5y=24$

$20+5y=24$

$5y=4$

$y=.80$

one burger + order of fries = 3.30

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23. You are planning a huge graduation party for your son. You decide to offer both a beef and a chicken meal at the party. The chicken dish costs $5, and the beef dish cost $7. There will be 250 people at the party, and the total cost of the food is $1500. How many chicken meals will there be? How many beef meals will there be?

X = chicken dish $5x+7y=1500$
y = beef dish $x+y=250$

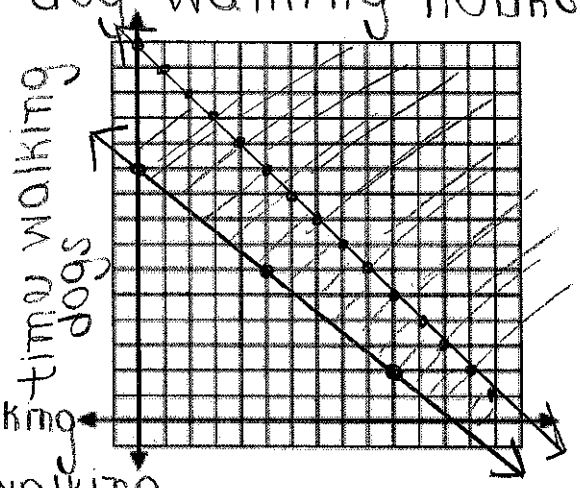
24. In order to save money for prom this weekend, Tom is going to walk his neighbor's dog for $6 per hour and wash cars for $7.50 per hour. His mother told him he can work no more than 15 hours in order to keep up with his homework. If Tom would like to make at least $75 to cover prom expenses, help him determine combinations of hours he can work between these two jobs.

i. Write and graph a system of linear inequalities.

X = car washing hours
y = dog walking hours

$6x+7.50y \geq 75 \rightarrow y \geq -\frac{4}{5}x+10$

$x+y \leq 15 \rightarrow y \leq -x+15$



ii. Write two possible solutions.

2 hrs car washing + 9 hrs dog walking

7 hrs car washing + 0 hrs dog walking

25. A fitness club needs to buy 30 treadmills and has planned on spending $45,000. Two models are available; one costs $1,100, and the other costs $2,100. What is a system of inequalities that represents this situation?

x = model that costs $1100
y = model that costs $2100

a. $\begin{cases} 1100x+2100y \geq 45,000 \\ x+y=30 \\ x \leq 0 \\ y \leq 0 \end{cases}$

b. $\begin{cases} 1100x+2100y \leq 45,000 \\ x+y=30 \\ x \geq 0 \\ y \geq 0 \end{cases}$

c. $\begin{cases} 1100x+2100y \leq 45,000 \\ x \geq 0 \\ y \geq 0 \end{cases}$

d. $\begin{cases} 1100x+2100y \geq 45,000 \\ x \leq 0 \\ y \leq 0 \end{cases}$