Date Completed: _____
Mentor Initials: _____

Systems of Equations

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Multiple Choice

1.

$$3x + 2y = 6$$
$$2x - y = 4$$

If (x, y) is the solution to the systems of equations above, what is the value of $x + y$?

A) 0
B) 1
C) 2
D) 4

2. In a forest, there are 3 times as many raccoons, *R*, as there are bears, *B*, and twice as many deer, *D*, as raccoons and bears combined. Which of the following systems of equations represent the number of each animal in the forest?

A) $(R + B) = 2D$
$R = 3B$

B) $(R + B) = \frac{1}{2}D$
$R = 3B$

C) $(R - D) = 2B$
$2D - R = 3B$

D) $(R + B) = 2D$
$3R = B$

3.

$$3x - 2y = 8$$
$$-4x + 3y = -2$$

If (x, y) is the solution to the systems of equations above, what is the value of $7x - y$?

A) 20
B) 46
C) 114
D) 162

4.

$$y + 7x = 25$$
$$6x + y = 23$$

If (x, y) is the solution to the systems of equations above, what is the value of x?

A) 0
B) 2
C) 11
D) 48

5.

$$y \leq 3x + 1$$
$$x - y \geq -3$$

Which of the following ordered pairs satisfies the inequalities above?

A) $(1, 4)$
B) $(-1, 4)$
C) $(-3, 8)$
D) $(-2, -1)$

6.

$$y = 11$$
$$y = -3(x - 11)^2 + 12$$

If the given equations are graphed in the xy-plane, at how many points do the graphs intersect?

A) Zero
B) One
C) Two
D) Infinitely Many

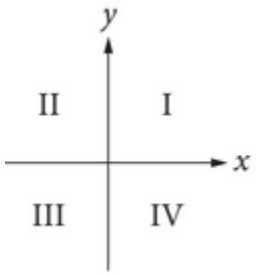
7.

$$4x - 3y = 6$$
$$-3x + 3y = -4$$

If (x, y) is the solution to the systems of equations above, what is the value of x?

A) -2
B) 2
C) 6
D) 14

8.



If the system of inequalities $y \leq -\frac{1}{3}x - 1$ and $y > 3x - 4$ is graphed in the xy-plane above, which quadrant contains no solutions to the system?

A) Quadrant I
B) Quadrant II
C) Quadrant III
D) There are solutions in all four quadrants

9. A spiritual healer charges a flat fee for a spiritual cleanse, with an additional fee for each chakra she heals. When Amelia has her spiritual cleanse, she also has three of her chakras healed and pays $140.00. John has all seven of his chakras healed during his spiritual cleanse, paying $220. Which of the following equations could be used to solve for the cost of healing one chakra?

A) $(140 - 3c) + 7c = 220$
B) $(140 - 7c) + 3c = 220$
C) $(220 + 3c) + 7c = 140$
D) $(140 + 3c) - 7c = 220$

10.

$$Cx + 4y = 8$$
$$Cx + 3y = 10$$

In the system of equations above, C is a nonzero constant. If (x, y) is the solution to the system of equations, which of the following is (x, y), in terms of C ?

A) $16C, -2$
B) $-2, 16C$
C) $\frac{16}{C}, -2$
D) $-2, \frac{16}{C}$

Grid-In

11. A Madonna-themed spa is having a Black Friday event and offering two treatments at a discounted rate: 'Papa Don't Bleach' (an all-natural hair lightening treatment) for \$50 and 'Espresso Yourself' (a caffeine face mask) for \$35. If the spa performs 90 treatments that day and makes \$4050, how many 'Papa Don't Bleach' treatments did they sell?

12. In the xy-plane, if a point with coordinates (p, q) lies in the solution set of the system of inequalities below, what is the maximum value of q?

$$y \leq 2400 - 12x$$
$$y \leq 6x$$

13.
$$5y + 3x = 7$$
$$2y - 4x = 5$$

Based on the systems of equations above, what is the value of $14y - 7x$?

14.
$$y + x = 7$$
$$y - x = 5$$

If (x, y) is the solution to the system of equations above, what is the value of x ?

15.
$$7(x + y) = 70$$
$$3x + 7y = 20$$

The solution to the given system of equations is (x, y). What is the value of $4x$?