# EOC Review- Unit 2: Linear Equations SCHOOLNET 2017

| Standard | Summary | Problems |
|---|---|---|
| A-CED.3 | Represent constraints by equations or inequalities, and by systems of equations and/or inequalities | Below |
| A-CED.4 | Re-arrange formula; isolate variable | Below |
| REI.3 | Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. | Below |
| REI.6 | Systems (word problems- all 3 methods: Substitution, Elimination, Graphing) | Below |
| REI.12 | Graphing Inequalities | Below |
| REI. 10 | Y=mx+b; "which of the following points is on the line?" | Below |

## EOC Practice Problems:

### A-CED.3 Practice:

5. Duane went to the store to buy hot dogs and buns for a cookout.

   - He needs at least 70 of each item.
   - Each package of hot dogs contains 10 hot dogs and costs $4.50.
   - Each package of buns contains 8 buns and costs $1.75.
   - Duane does not want to have any leftover buns.

   What is the minimum total price Duane will pay for the hot dogs and buns?

   A. $43.75

   B. $45.50

   C. $47.25

   D. $51.75

6. Dr. Smith's office is open 8 hours a day. The doctor allows 25 minutes for office visits and 50 minutes for procedures. The doctor can perform up to 5 procedures per day. Let $x$ represent the number of office visits and $y$ the number of procedures. Which system of inequalities models this scenario?

A. $0 \leq x \leq 5$
$0 \leq y$
$25x + 50y \leq 480$

B. $0 \leq x \leq 19$
$0 \leq y \leq 5$
$25x + 50y \leq 480$

C. $0 \leq x$
$0 \leq y \leq 5$
$25x + 50y \leq 8$

D. $0 \leq x \leq 5$
$0 \leq y \leq 19$
$25x + 50y \leq 8$

8. Oliver has a faucet leaking at a constant rate outside his home. The equation $y = 2.5x$ can be used to find the number of gallons of water that will leak from the faucet in $x$ days if he does not fix the leak. Which restriction on the value of either variable in this equation is true based on the information provided?

A. $x$ is a rational number greater than 0.

B. $x$ is an irrational number greater than 0.

C. $y$ is a multiple of 5 greater than or equal to $2.5$.

D. $y$ is a multiple of $2.5$ greater than or equal to $2.5$.

9. Ralph assembles pieces of furniture at a factory. It takes him $3\frac{3}{4}$ hours to assemble a desk. It takes him $2\frac{1}{2}$ hours to assemble a chair.

Ralph can work no more than 40 hours each week. During the week, he must assemble at least 10 chairs and a total of at least 12 pieces of furniture.

In the following inequalities, $d$ represents the number of desks and $c$ represents the number of chairs that Ralph can assemble within one week. Which system of inequalities can Ralph use to determine the maximum number of each item he can assemble?

A. $\begin{cases} c \le -\frac{3}{2}d + 16 \\ c \ge 10 \\ c \ge -d + 12 \end{cases}$

B. $\begin{cases} c \ge -\frac{3}{2}d + 16 \\ c \le 10 \\ c \le -d + 12 \end{cases}$

C. $\begin{cases} c \le -\frac{16}{4}d + 40 \\ c \ge 10 \\ c \ge -d + 12 \end{cases}$

D. $\begin{cases} c \ge -\frac{16}{4}d + 40 \\ c \le 10 \\ c \le -d + 12 \end{cases}$

10. A pottery shop sells plates and bowls.

- The shop expects to sell, at least, 10 plates and 15 bowls each day.
- The shop expects to sell, at most, 50 total pieces each day.
- Each plate sells for $14 and each bowl sells for $8.

How many bowls does the shop sell if they made the maximum daily income?

A. 10

B. 15

C. 35

D. 40

12. The Student Council is having a talent show.

- They plan to sell no more than 500 student tickets and no more than 300 general admission tickets.
- It costs $0.50 per ticket to advertise the show to the students and $1 per ticket to advertise the show to the general public.
- The advertising budget is, at most, $400 for the show.
- Student Council makes $6 profit for a student ticket and $9 profit for a general admission ticket.

What is the maximum profit that the Student Council can expect from the show?

A. $4,350

B. $3,900

C. $3,000

D. $2,750

14. Charlotte makes bracelets.

- A small bracelet costs $0.50 to make and takes a half hour to create.
- A large bracelet costs $1.50 to make and takes an hour to create.
- Charlotte has only $20 for supplies and 10 hours to work on bracelets each week.

Which is a possible number of small and large bracelets that Charlotte can make each week?

A. 2 small, 13 large

B. 6 small, 7 large

C. 8 small, 12 large

D. 14 small, 6 large

18. A system of inequalities is shown below.

$$y > -2x + 5$$

$$y \leq -3$$

Which point is a viable solution to the system?

A. (1, -2)

B. (4, -3)

C. (6, 2)

D. (8, -4)

## A-CED.4 Practice:

4. **Which is not equivalent to** $Ax + By = C$ **?**

A. $y = \frac{C}{B} - \frac{A}{B}x$

B. $y = \frac{C - Ax}{B}$

C. $y = \frac{C}{B} - \frac{Ax}{B}$

D. $y = \frac{C - A}{B}x$

5. **Which equation can be used to find the height of a trapezoid given the area and the lengths of the two bases?** $\left(A = \frac{1}{2}h(b_1 + b_2)\right)$

A. $h = \frac{1}{2}A - (b_1 + b_2)$

B. $h = \frac{2A}{b_1} + \frac{2A}{b_2}$

C. $h = \frac{1}{2}A \div (b_1 + b_2)$

D. $h = \frac{2A}{b_1 + b_2}$

11. The circumference of a circle is given by the formula $C = \pi d$, where $d$ is the diameter of the circle. Which formula represents the radius of the circle, $r$, in terms of the circumference?

A. $r = \frac{2\pi}{C}$

B. $r = \frac{\pi}{C}$

C. $r = \frac{C}{2\pi}$

D. $r = \frac{C}{\pi}$

13. Which equation is equivalent to $x = m(p - q)$?

A. $q = m + \frac{x}{p}$

B. $q = p + \frac{x}{m}$

C. $q = p - \frac{x}{m}$

D. $q = m - \frac{x}{p}$

15. What equation is equivalent to $24 = ax + 4y - 10$, when solving for $y$?

A. $y = \frac{7}{2} - \frac{ax}{4}$

B. $y = \frac{17}{2} - \frac{ax}{4}$

C. $y = 17 - \frac{ax}{4}$

D. $y = 34 - ax$

16. The volume of a spherical tank is given by $V = \frac{4}{3}\pi r^3$. If the volume of the tank is known, which expression can be used to find its radius?

A. $\sqrt[3]{\frac{3\pi}{4V}}$

B. $\sqrt[3]{\frac{3V}{4\pi}}$

C. $\sqrt[3]{\frac{4\pi}{3V}}$

D. $\sqrt[3]{\frac{4V}{3\pi}}$

119. Which equation is equivalent to $K = \frac{3gy}{5f}$?

A. $g = \frac{3y}{5fK}$

B. $g = \frac{3Ky}{5f}$

C. $g = \frac{5fK}{3y}$

D. $g = \frac{5f}{3Ky}$

# A-REI.3 Practice:

1. **What is the solution to the inequality** $-y + 10 > -(3y + 4)$?

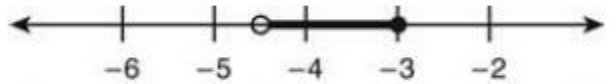
   A. $y > 3$

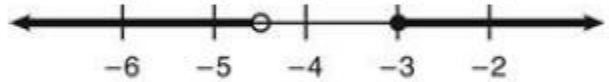
   B. $y > -\frac{3}{2}$

   C. $y > -3$

   D. $y > -7$

4. **Which graph represents the solution to the inequality** $3 \leq 2 - \frac{x}{3} < \frac{7}{2}$?

   A.
   
   

   B.
   
   

   C.
   
   

   D.
   
   

11. What is the value of $x$ in the equation $Ax + 4Ax = 51 + 2Ax$?

    A. $X = \frac{17}{A}$

    B. $X = \frac{51}{2A}$

    C. $X = \frac{51}{7A}$

    D. $X = \frac{51}{A}$

16. **The members of the Math Club are buying T-shirts. The shirts will cost \$5.00 each plus a one-time fee of \$20.00 for the design of the shirt. The total order can be at most \$170. The inequality** $5n + 20 \leq 170$ **can be solved to determine *n*, the number of T-shirts that can be purchased. Which inequality best represents the solution?**

    A. $n \geq 30$

    B. $n \leq 30$

    C. $n \geq 38$

    D. $n \leq 38$

30. What is the solution set for $3x - 6 \leq {}^{-}2x + 4$?

A. $x \leq {}^{-}2$

B. $x \leq \frac{{}^{-}2}{5}$

C. $x \leq \frac{2}{5}$

D. $x \leq 2$

47. **What is the solution for** $-6x + 9 \leq 2 - 5(x + 1)$?

A. $x \leq 4$

B. $x \geq 4$

C. $12 \leq x$

D. $12 \geq x$

67. What is the solution to $3 - (x + 1) = 5x + 6 - 7x$?

A. $x = {}^{-}3$

B. $x = 1$

C. $x = 2$

D. $x = 4$

93. What is the solution to the equation ${}^{-}3x + 17 = 12 - x$?

A. ${}^{-}2\frac{1}{2}$

B. $\frac{2}{5}$

C. $1\frac{1}{4}$

D. $2\frac{1}{2}$

# A-REI.6 Practice:

1. A hardware store sold 10 hammers and 120 packages of nails for $950.50. If it sells one hammer and one package of nails for $12, how much does one package of nails cost?

   A. $2.00

   B. $4.45

   C. $7.55

   D. $7.92

3. **What is the point of intersection of the lines represented by these equations?**

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

   A. $(-1, -5)$

   B. $(-1, 5)$

   C. $(1, -3)$

   D. $(1, 3)$

7. Two trains are traveling towards each other at a constant speed.

   - The trains are currently 714 miles from each other.
   - The speeds of the trains differ by 8 miles per hour.
   - The trains will meet in 7 hours.

   What is the speed of the faster train?

   A. 47 mph

   B. 50 mph

   C. 55 mph

   D. 58 mph

12. **Linda graphed a system of equations and found that it had no solution. Which could be the system of equations that Linda graphed?**

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

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

B. $2x + y = 4$

$y = -2x - 1$

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

$3y = 2x + 3$

D. $3y = 2x + 4$

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

13. A system of equations is shown below.

$$2x - y = 0$$
$$x + 2y = 5$$

What is the solution to the system?

A. (0, 0)

B. (1, 2)

C. (2, 4)

D. (3, 1)

14. Sue paid $46 for 2 adult and 4 child tickets to a play. Karen paid $86 for 4 adult and 7 child tickets to the same play. What is the cost of 1 adult and 1 child ticket?

A. $17.00

B. $17.50

C. $18.50

D. $19.00

16. The sum of two numbers is 59. The difference between the two numbers is 11. Which is the smaller of the two numbers?

A. 20

B. 22

C. 24

D. 26

22. A system of equations is shown below.

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

$$2y - x = 4$$

Which describes the graph of the system?

A. one line

B. two parallel lines

C. two non-perpendicular intersecting lines

D. two perpendicular lines

39. Skim milk is 0.1% fat. Whole milk is 3.5% fat. ***Approximately*** how much skim milk is needed to make 4 gallons of 2% fat milk?

A. 1.65 gallons

B. 1.76 gallons

C. 1.80 gallons

D. 1.89 gallons

47. A 4-pound box of rice, which is a mixture of white rice and wild rice, sells for $1.80 per pound.

- White rice sells for $0.75 per pound.
- Wild rice sells for $2.25 per pound.

How much white rice is in the mixture?

A. 1.2 pounds

B. 1.4 pounds

C. 2.8 pounds

D. 3.6 pounds

48. **What is the solution to the system of equations below?**

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

A. (0, 15)
B. (1, 2)
C. infinitely many solutions
D. no solution

91. Linda has a total of $4,000 invested in two accounts. One account pays 5% interest, and the other pays 8% interest. How much does she have invested in each account if her total interest for a year is $284?

A. $1,200 at 5% and $2,800 at 8%

B. $1,600 at 5% and $2,400 at 8%

C. $2,400 at 5% and $1,600 at 8%

D. $2,800 at 5% and $1,200 at 8%

111. **A barge traveled 17.5 miles upstream on a river in 7 hours. The return trip took the barge 5 hours. What is the rate of the barge in still water, in miles per hour?**

A. 0.5
B. 2.5
C. 3.0
D. 3.5

130. A metal alloy is 30% copper. Another metal alloy is 55% copper. How much of each alloy should be used to make 800 grams of a metal alloy that is 40% copper?

A. 480 grams of the 30% copper alloy and 320 grams of the 55% copper alloy

B. 460 grams of the 30% copper alloy and 340 grams of the 55% copper alloy

C. 440 grams of the 30% copper alloy and 360 grams of the 55% copper alloy

D. 420 grams of the 30% copper alloy and 380 grams of the 55% copper alloy

149. Two cars leave Charlotte at the same time.

- One car is moving east and the other west.
- After 4 hours, the cars are 456 miles apart.
- One car is traveling 10 miles per hour faster than the other.

What is the speed of the slower-moving car?

A. 47 miles per hour

B. 52 miles per hour

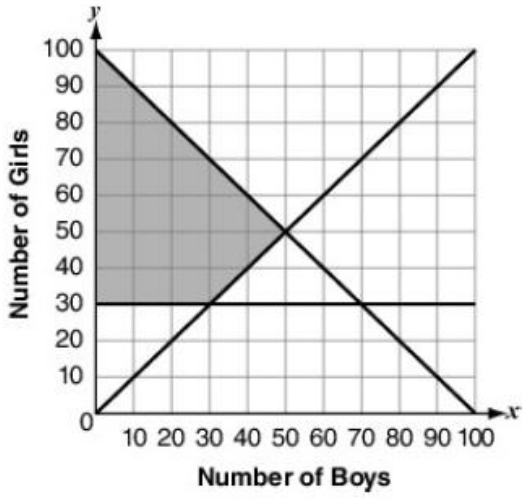
C. 62 miles per hour

D. 67 miles per hour

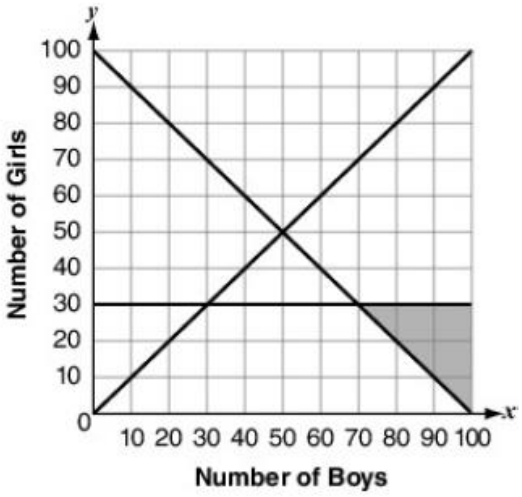
# A-REI.12 Practice:

1. A private school admits no more than 100 students every year. Additionally, **at least** 30 of these students must be girls, and the school admits **at least** as many girls as boys. Which graph shows the possible numbers of boys, $x$, and girls, $y$, the school admits each year?

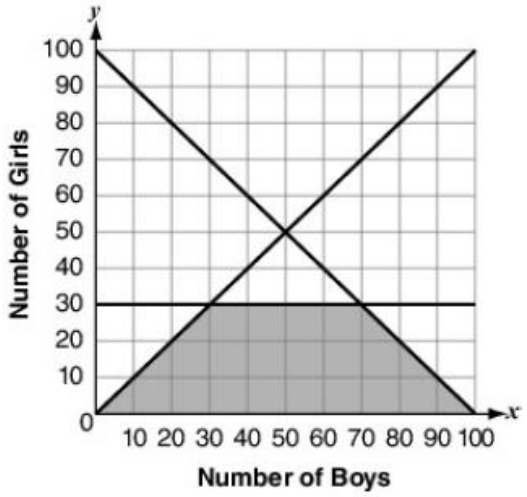
A.



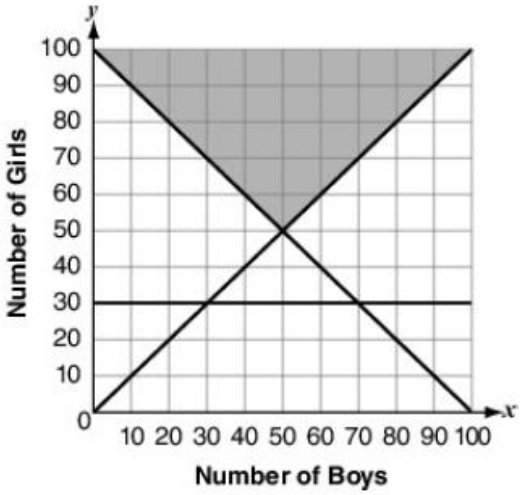

C.




B.

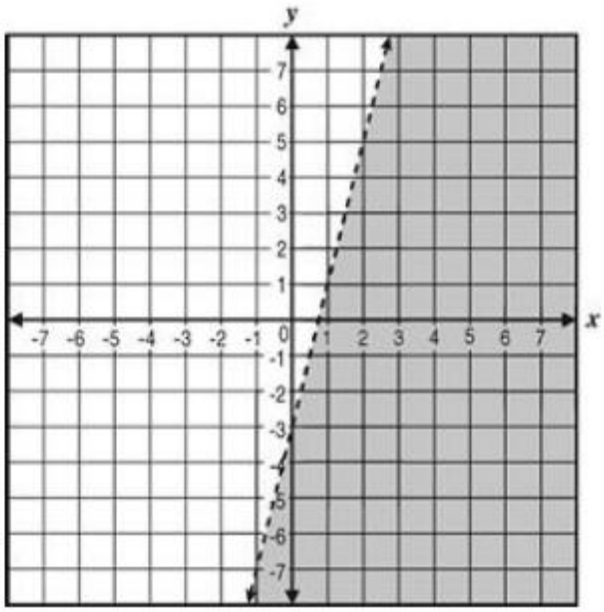



D.

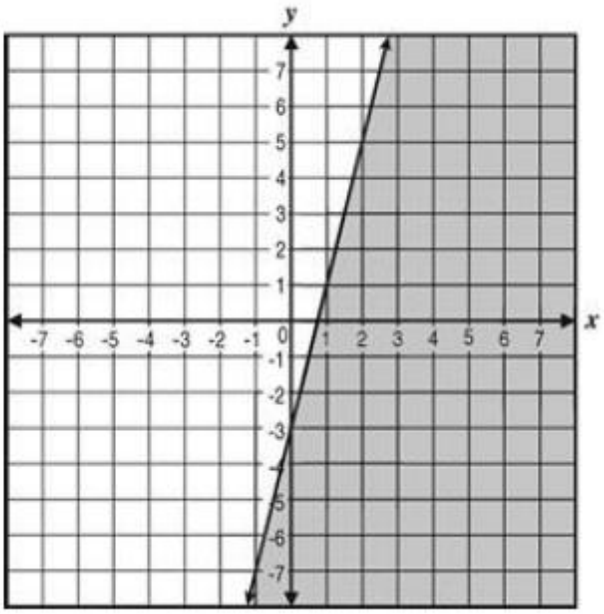


2. **Which of the following graphs represents the region defined by the inequality** $y > 4x - 3$?

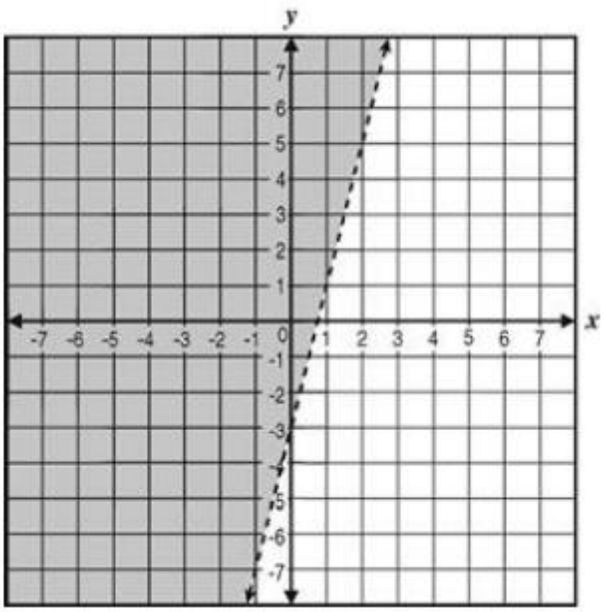
A.



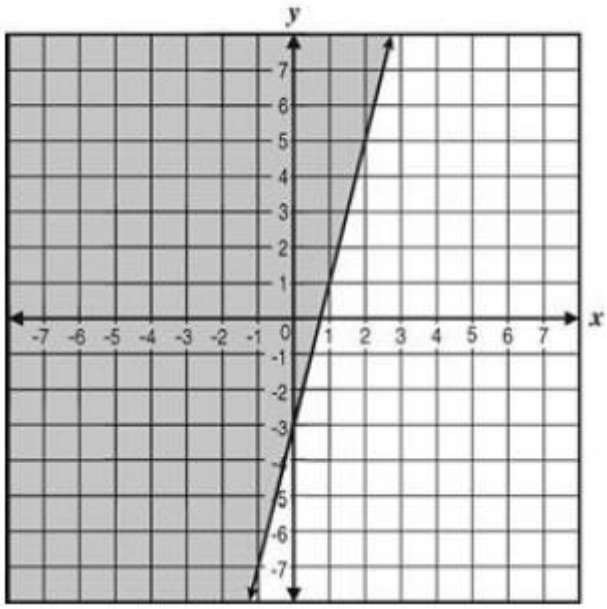

B.



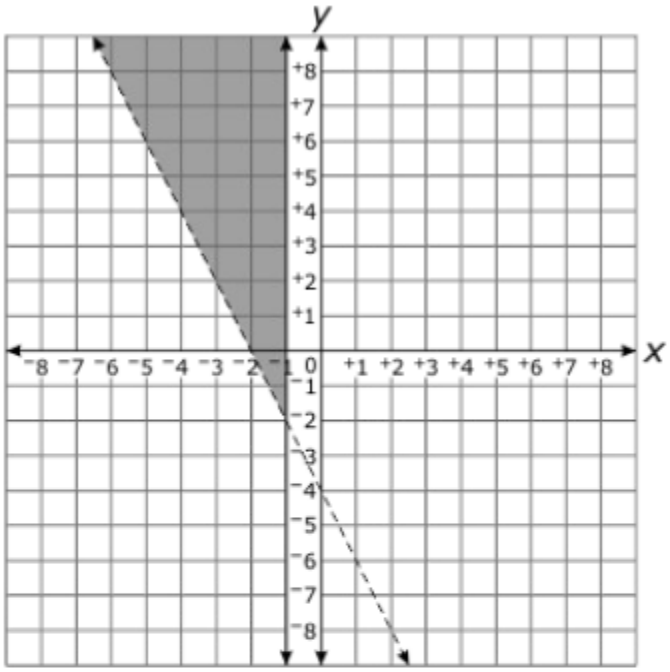

C.




D.



4. Which system of inequalities is graphed below?



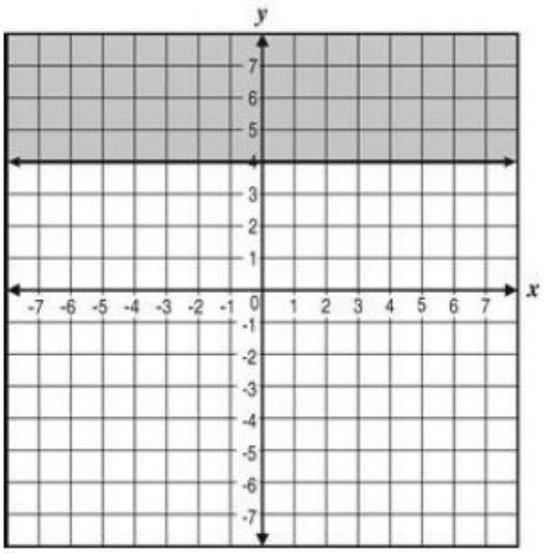

A. $y < 2x - 4$
$x \geq 1$

B. $-2x - y < 4$
$-x \geq 1$

C. $-2x - y > 4$
$-x \leq 1$

D. $y > 2x - 4$
$x \leq 1$

5. **Which of the following inequalities is shown in the graph below?**



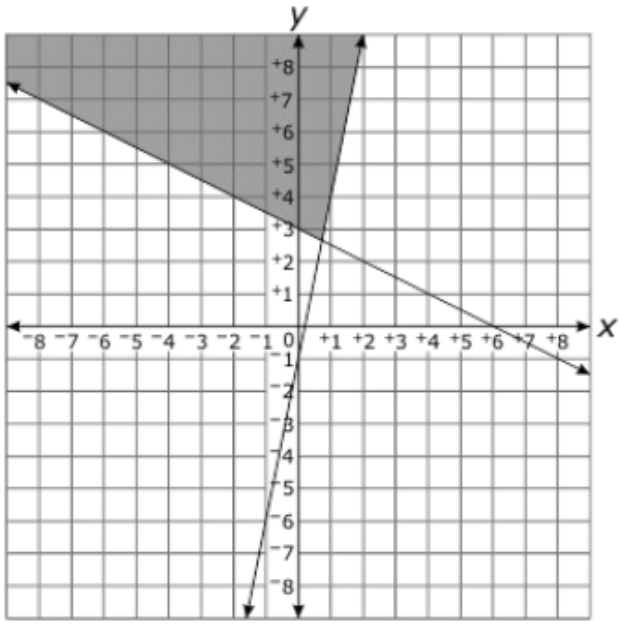

A. $y - 4 \leq 0$

B. $y + 4 \leq 0$

C. $y - 4 \geq 0$

D. $y + 4 \geq 0$

7. Which system of inequalities is graphed below?



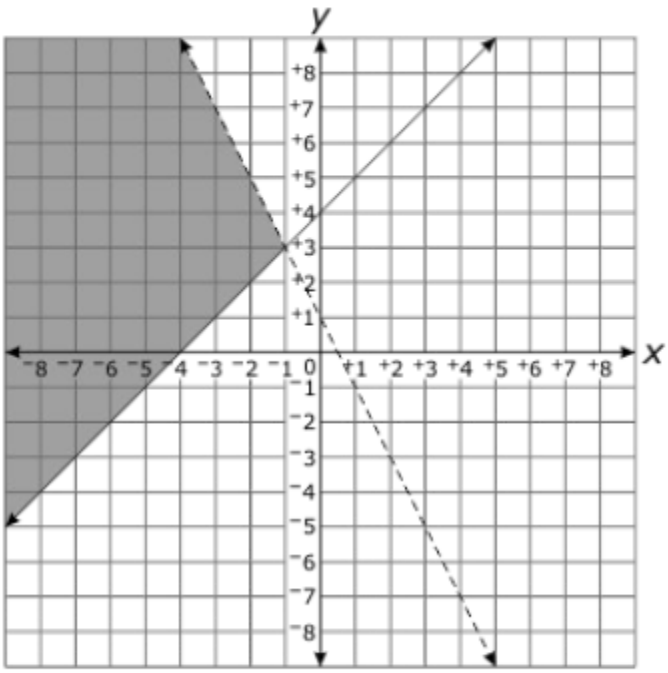

A. $y \geq -\frac{1}{2}x + 3$ and $y \geq 5x - 1$

B. $y \geq -\frac{1}{2}x + 3$ and $y \leq 5x - 1$

C. $y \leq -\frac{1}{2}x + 3$ and $y \geq 5x - 1$

D. $y \leq -\frac{1}{2}x + 3$ and $y \leq 5x - 1$

14. Which system of inequalities is graphed below?




A. $y > x + 4$
$y \leq 1 - 2x$

B. $y < x + 4$
$y \geq 1 - 2x$

C. $y \geq x + 4$
$y < 1 - 2x$

D. $y \leq x + 4$
$y > 1 - 2x$

21. A system of inequalities is shown below.

$$6x - 3y \geq 18$$
$$2x + 6y > 12$$

Which point is a solution to the system?

A. (0, 0)

B. (4, 2)

C. (6, 0)

D. (3, 8)

24. Which quadrants contain solutions of the inequality $y < 3x - 7$ ?

A. II, III, and IV

B. I, III, and IV

C. I and IV

D. II and IV

28. A system of inequalities is shown below.

$$y > \frac{1}{2}x - 5$$

$$y < -3x + 3$$

Which point is a solution to the system?

A. $(-2, 6)$

B. $(0, -5)$

C. $(0, 3)$

D. $(5, -1)$

29. **Which solutions satisfy the system of linear inequalities below?**

$$y < 3$$
$$y > -2$$

A. (4, 1) and (1, 2)

B. (6, – 3) and (3, 4)

C. (0, 0) and (0, –2)

D. This system has no solution.

## A-REI.10 Practice:

1. Which point lies on the graph of the equation $10y = 3x - 11$?

A. $(2, -0.5)$

B. $(4, 1)$

C. $(6, 16.3)$

D. $(8, 23)$

2. Which point lies on the graph of $y = \frac{-2}{3}x + 8$ ?

A. (6, 4)

B. (0, 7)

C. $(-2, 9)$

D. $(-4, 10)$

3. Which point lies on the graph of $3x + 2y = x + 8$?

A. $(5, -6)$

B. $(7, -3)$

C. $(8, -8)$

D. $(10, -26)$

4. Which point is a solution to the equation $y = (-2)^x$ ?

A. $\left(-3, \frac{-1}{8}\right)$

B. $\left(-1, \frac{1}{2}\right)$

C. $(2, -4)$

D. $(3, -6)$

5. Which graph contains the point (3, 8)?

A. $y = 3x + 8$

B. $2y + x = 14$

C. $y = 3^x - 1$

D. $y = 2^x$

6. Which point is an ***approximate*** solution to the equation $y = 2(1.03)^x$?

A. (2, 2)

B. (2, 2.06)

C. (2, 2.12)

D. (2, 4.12)

8. Which coordinate is on the graph of the equation $4x = 12 - 2y$?

A. $(^{-}3, 12)$

B. $(^{-}2, ^{-}2)$

C. $(3, ^{-}12)$

D. (5, 4)

9. Which point is ***not*** a solution to the equation $y = 0.25^x$ ?

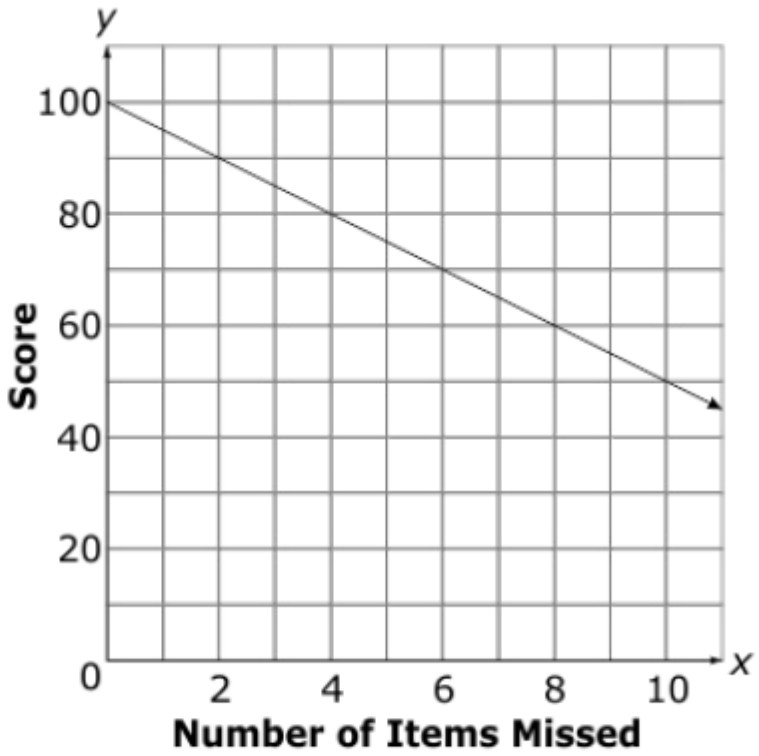
A. (2, 0.5)

B. (0, 1)

C. $(^{-}1, 4)$

D. $(^{-}2, 16)$

10. The graph below shows the number of items missed on a test and the corresponding score.




Which items missed and score combination is ***not*** correct?

A. (1, 95)

B. (5, 75)

C. (7, 60)

D. (14, 30)

24. The points (3, ⁻2) and (⁻6, ⁻5) form a line. Which point lies on the same line?

A. (12, 6)

B. (8, 3)

C. (⁻1, ⁻1)

D. (⁻3, ⁻4)

27. Which graph does ***not*** contain the point (2, 5)?

A. $y = 3^x - 4$

B. $x + 13 = 3y$

C. $y = 2(3)^x - 7$

D. $x - 4y = {}^-18$

28. Which point lies on the graph of $y = 6(2)^x$ ?

A. (3, 36)

B. (1, 8)

C. (0, 12)

D. $({}^-1, 3)$