Name: _____ Period: _____ Date: _____

Solving Systems $(f(x) = g(x))$ – Standard A.REI.B.3

1.

Given: $f(x) = \frac{2}{3}x - 4$ and $g(x) = \frac{1}{4}x + 1$

Four statements about this system are written below.

I. $f(4) = g(4)$

II. When $x = 12$, $f(x) = g(x)$.

III. The graphs of $f(x)$ and $g(x)$ intersect at $(12,4)$.

IV. The graphs of $f(x)$ and $g(x)$ intersect at $(4,12)$.

Which statement(s) are true?

1) II, only
2) IV, only
3) I and IV
4) II and III

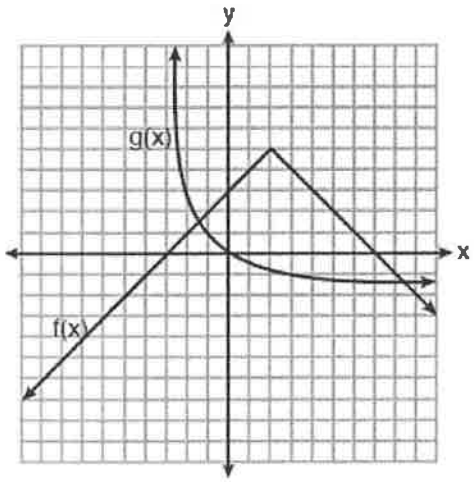
2.

Two functions, $y = |x - 3|$ and $3x + 3y = 27$, are graphed on the same set of axes. Which statement is true about the solution to the system of equations?

1) $(3,0)$ is the solution to the system because it satisfies the equation $y = |x - 3|$.
2) $(9,0)$ is the solution to the system because it satisfies the equation $3x + 3y = 27$.
3) $(6,3)$ is the solution to the system because it satisfies both equations.
4) $(3,0)$, $(9,0)$, and $(6,3)$ are the solutions to the system of equations because they all satisfy at least one of the equations.

3.

The functions $f(x)$ and $g(x)$ are graphed below.

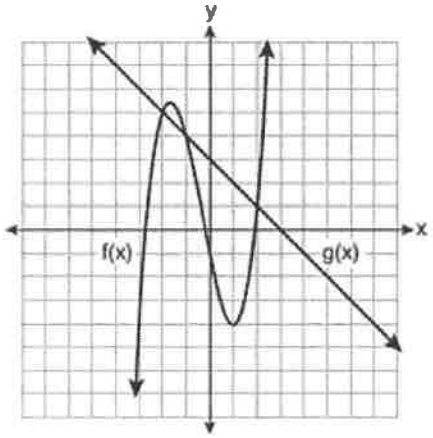


Based on the graph, the solutions to the equation $f(x) = g(x)$ are

1) the x-intercepts
2) the y-intercepts
3) the x-values of the points of intersection
4) the y-values of the points of intersection

4.

The functions $f(x)$ and $g(x)$ are graphed on the set of axes below.



For which value of x is $f(x) \neq g(x)$?

1) -1
2) 2
3) 3
4) -2

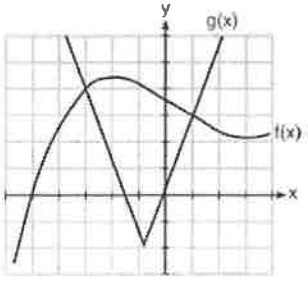
5.

Which pair of equations would have $(-1,2)$ as a solution?

1) $y = x + 3$ and $y = 2^x$
2) $y = x - 1$ and $y = 2x$
3) $y = x^2 - 3x - 2$ and $y = 4x + 6$
4) $2x + 3y = -4$ and $y = -\frac{1}{2}x - \frac{3}{2}$

6.

The graph below shows two functions, $f(x)$ and $g(x)$. State all the values of x for which $f(x) = g(x)$.



7.

Given the functions $h(x) = \frac{1}{2}x + 3$ and $j(x) = |x|$, which value of x makes $h(x) = j(x)$?

1) -2
2) 2
3) 3
4) -6

8.

What is the total number of points of intersection for the graphs of the equations $y = x^2$ and $y = -x^2$?

1) 1
2) 2
3) 3
4) 0

9.

The path of a rocket is represented by the equation $y = \sqrt{25 - x^2}$. The path of a missile designed to intersect the path of the rocket is represented by the equation $x = \frac{3}{2}\sqrt{y}$. The value of x at the point of intersection is 3. What is the corresponding value of y?

1) -2 2) 2 3) -4 4) 4

10.

The flight paths of two Thunderbird jets are plotted on a Cartesian coordinate plane, and the equations of the jets' flight paths are represented by $y = 2^x + 3$ and $y = 0.5^x$. The best approximation of the intersection of the flight paths is

1) (−1.72,3.3) 2) (0,1) 3) (−1.50,2.82) 4) (−2,−1)

11.

For which values of x, rounded to the *nearest hundredth*, will $|x^2 - 9| - 3 = \log_3 x$?

1) 2.29 and 3.63 2) 2.37 and 3.54 3) 2.84 and 3.17 4) 2.92 and 3.06

12.

To the *nearest tenth*, the value of x that satisfies $2^x = -2x + 11$ is

1) 2.5 2) 2.6 3) 5.8 4) 5.9

13.

Sally's high school is planning their spring musical. The revenue, R, generated can be determined by the function $R(t) = -33t^2 + 360t$, where t represents the price of a ticket. The production cost, C, of the musical is represented by the function $C(t) = 700 + 5t$. What is the highest ticket price, to the *nearest dollar*, they can charge in order to *not* lose money on the event?

1) $t = 3$
2) $t = 5$
3) $t = 8$
4) $t = 11$

14.

A pelican flying in the air over water drops a crab from a height of 30 feet. The distance the crab is from the water as it falls can be represented by the function $h(t) = -16t^2 + 30$, where t is time, in seconds. To catch the crab as it falls, a gull flies along a path represented by the function $g(t) = -8t + 15$. Can the gull catch the crab before the crab hits the water? Justify your answer. [The use of the accompanying grid is optional.]