

A.REI.D.11: Other Systems 1

- 1 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.

- 2 The graphs of the functions $f(x) = |x - 3| + 1$ and $g(x) = 2x + 1$ are drawn. Which statement about these functions is true?
 - 1) The solution to $f(x) = g(x)$ is 3.
 - 2) The solution to $f(x) = g(x)$ is 1.
 - 3) The graphs intersect when $y = 1$.
 - 4) The graphs intersect when $x = 3$.

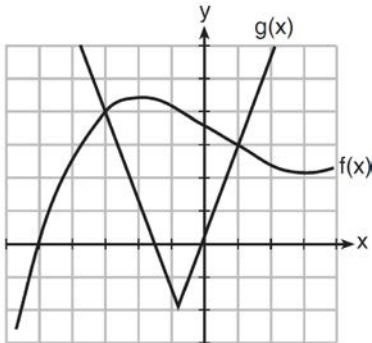
- 3 Which value of x results in equal outputs for $j(x) = 3x - 2$ and $b(x) = |x + 2|$?
 - 1) -2
 - 2) 2
 - 3) $\frac{2}{3}$
 - 4) 4

- 4 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

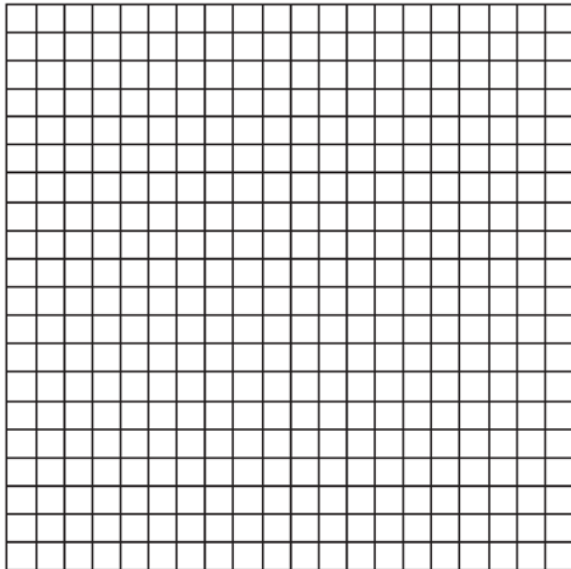
- 5 What is the total number of points of intersection for the graphs of the equations $y = x^2$ and $y = -x^2$?
 - 1) 1
 - 2) 2
 - 3) 3
 - 4) 0

- 6 What is one solution of the accompanying system of equations?
$$y = -x^2 + 5$$
$$y = -0.5x^2 + 3$$
 - 1) $(3, 5)$
 - 2) $(0, 5)$
 - 3) $(-2, 1)$
 - 4) $(0, 3)$

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



- 8 Graph $f(x) = |x|$ and $g(x) = -x^2 + 6$ on the grid below. Does $f(-2) = g(-2)$? Use your graph to explain why or why not.

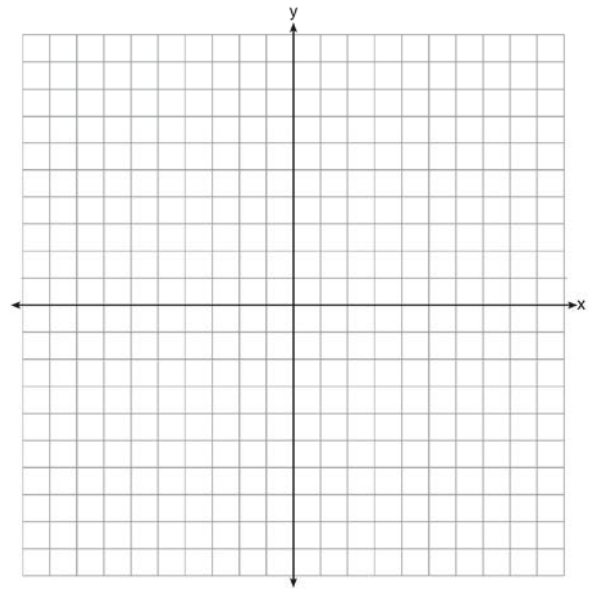


- 9 On the set of axes below, graph

$$g(x) = \frac{1}{2}x + 1$$

and

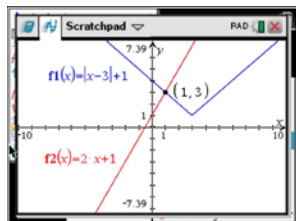
$$f(x) = \begin{cases} 2x + 1, & x \leq -1 \\ 2 - x^2, & x > -1 \end{cases}$$



How many values of x satisfy the equation $f(x) = g(x)$? Explain your answer, using evidence from your graphs.

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Answer Section

- 1 ANS: 3 REF: 011518ai
 2 ANS: 2



$$\begin{aligned}
 |x-3| + 1 &= 2x + 1 & x-3 &= 2x & x-3 &= -2x \\
 |x-3| &= 2x & -3 &= x & 3x &= 3 \\
 & & \text{extraneous} & & x &= 1
 \end{aligned}$$

REF: 061622ai

- 3 ANS: 2
 $|x+2| = 3x-2$
 $x+2 = 3x-2$
 $4 = 2x$
 $x = 2$

REF: 081702ai

- 4 ANS: 1
 $\frac{1}{2}x + 3 = |x|$ $-\frac{1}{2}x - 3 = x$
 $\frac{1}{2}x + 3 = x$ $-x - 6 = 2x$
 $x + 6 = 2x$ $-6 = 3x$
 $6 = x$ $-2 = x$

REF: 011617ai

- 5 ANS: 1

$x^2 = -x^2$
 $2x^2 = 0$ $(0, 0)$
 $x = 0$

X	Y ₁	Y ₂
-3	9	-9
-2	4	-4
-1	1	-1
0	0	0
1	1	-1
2	4	-4
3	9	-9

X=0

REF: 080611b

6 ANS: 3

$$-x^2 + 5 = -0.5x^2 + 3$$

$$-0.5x^2 = -2$$

$$x^2 = 4$$

$$x = \pm 2$$

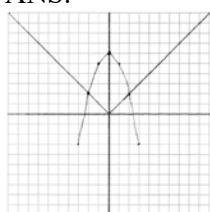
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7 ANS:

-3, 1

REF: 081630ai

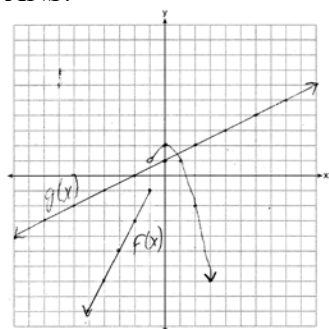
8 ANS:



Yes, because the graph of $f(x)$ intersects the graph of $g(x)$ at $x = -2$.

REF: 011733ai

9 ANS:



1, because the graphs only intersect once.

REF: 061636ai