A.REI.D.11: Other Systems 2

1 Selected values for the functions f and g are shown in the tables below.

x	f(x)
–3.12	–4.88
0	–6
1.23	–4.77
8.52	2.53
9.01	3.01

x	g(x)
–2.01	–1.01
0	0.58
8.52	2.53
13.11	3.01
16.52	3.29

A solution to the equation $f(x) = g(x)$ is

1) 0
2) 2.53
3) 3.01
4) 8.52

2 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

3 Which value, to the *nearest tenth*, is *not* a solution of $p(x) = q(x)$ if $p(x) = x^3 + 3x^2 - 3x - 1$ and $q(x) = 3x + 8$?

1) –3.9
2) –1.1
3) 2.1
4) 4.7

4 If $f(x) = 3|x| - 1$ and $g(x) = 0.03x^3 - x + 1$, an approximate solution for the equation $f(x) = g(x)$ is

1) 1.96
2) 11.29
3) (–0.99, 1.96)
4) (11.29, 32.87)

5 If $f(x) = (x^2 + 3x + 2)(x^2 - 4x + 3)$ and $g(x) = x^2 - 9$, then how many real solutions are there to the equation $f(x) = g(x)$?

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

6 A landscape architect's designs for a town park call for two parabolic-shaped walkways. When the park is mapped on a Cartesian coordinate plane, the pathways intersect at two points. If the equations of the curves of the walkways are $y = 11x^2 + 23x + 210$ and $y = -19x^2 - 7x + 390$, determine the coordinates of the two points of intersection. [Only an algebraic solution can receive full credit.]

7 Given: $h(x) = \frac{2}{9}x^3 + \frac{8}{9}x^2 - \frac{16}{13}x + 2$

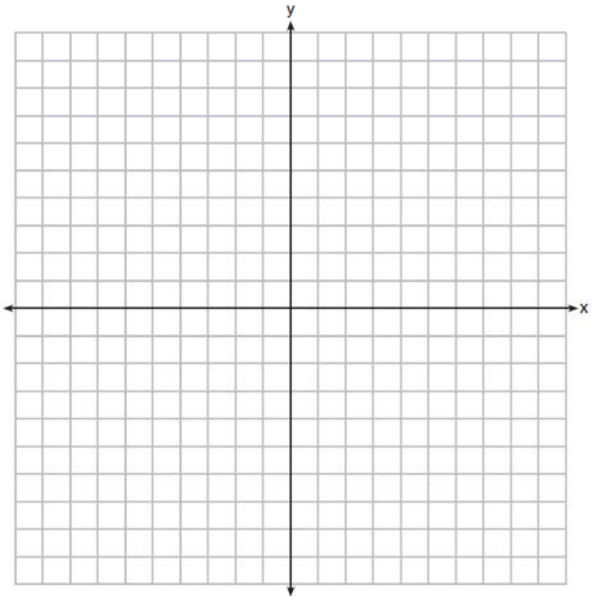
$k(x) = -|0.7x| + 5$

State the solutions to the equation $h(x) = k(x)$, rounded to the *nearest hundredth*.

8 On the set of axes below, graph $y = f(x)$ and $y = g(x)$ for the given functions.

$f(x) = x^3 - 3x^2$

$g(x) = 2x - 5$



State the number of solutions to the equation $f(x) = g(x)$.

A.REI.D.11: Other Systems 2
Answer Section

1 ANS: 4 REF: 061914aii

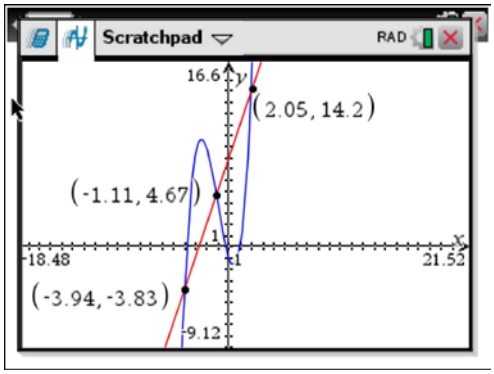
2 ANS: 4

$$y = \sqrt{25 - x^2} = \sqrt{25 - 3^2} = 4.$$

$$x = \frac{3}{2}\sqrt{y}$$
$$3 = \frac{3}{2}\sqrt{y}$$
$$2 = \sqrt{y}$$
$$y = 4$$

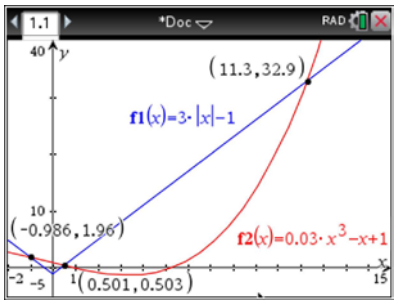
REF: 060205b

3 ANS: 4



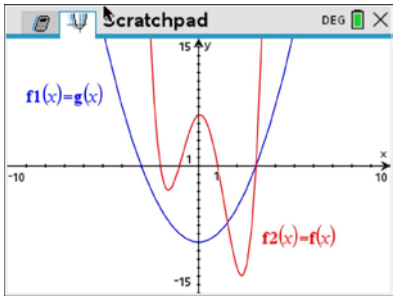
REF: 061622aii

4 ANS: 2



REF: 061705aii

5 ANS: 2



REF: 082319aii

6 ANS:

$$11x^2 + 23x + 210 = -19x^2 - 7x + 390$$

$$30x^2 + 30x - 180 = 0$$

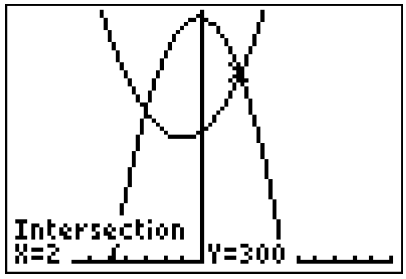
$$x^2 + x - 6 = 0$$

$$(x+3)(x-2) = 0$$

$$x = -3 \quad x = 2$$

$(2,300),(-3,240).$ $y = 11(-3)^2 + 23(-3) + 210 = 240.$

$y = 11(2)^2 + 23(2) + 210 = 300.$



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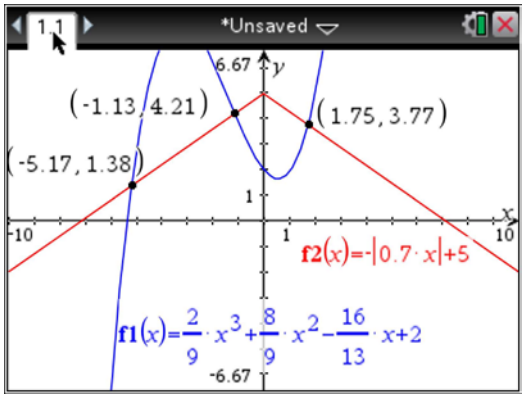
7 ANS:



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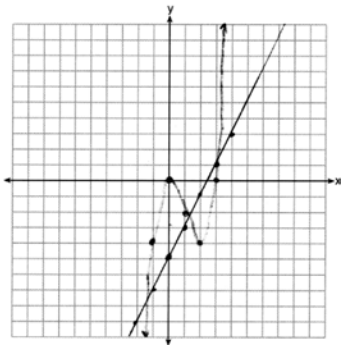
8 ANS:



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REF: 062233aii