

A.REI.C.7: Quadratic-Linear Systems 4

- 1 How many real solutions exist for the system of equations below?

$$y = \frac{1}{4}x - 8$$

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

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

- 2 Which point is in Quadrant III and is a solution to the system below?

$$y = x^2 - 24$$

$$y = x - 12$$

- 1) (4, -8)
- 2) (-3, -15)
- 3) (-4, -16)
- 4) (-3, -33)

- 3 The graphs of the equations $y = x^2 + 4x - 1$ and $y + 3 = x$ are drawn on the same set of axes. One solution of this system is

- 1) (-5, -2)
- 2) (-1, -4)
- 3) (1, 4)
- 4) (-2, -1)

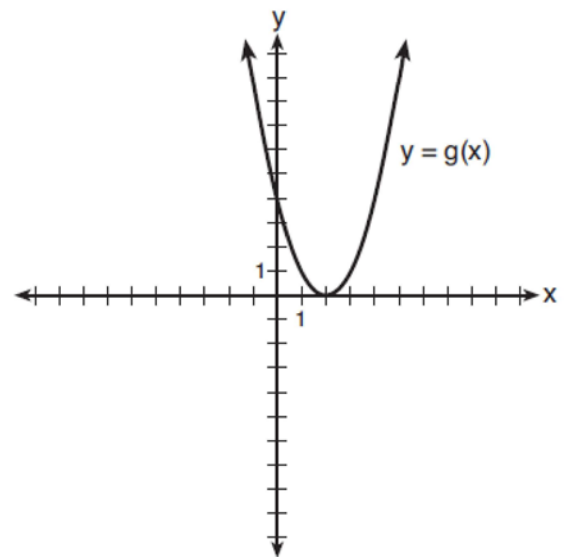
- 4 What is the solution set of the following system of equations?

$$y = 3x + 6$$

$$y = (x + 4)^2 - 10$$

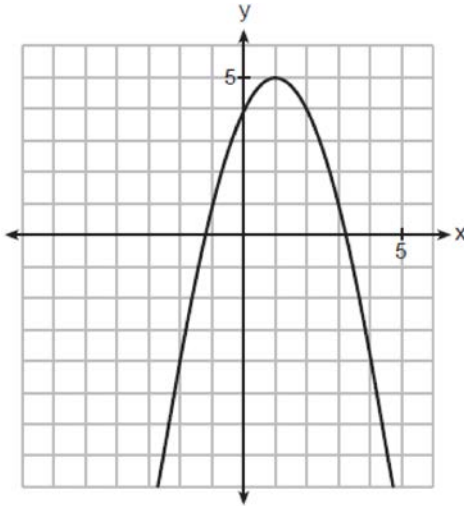
- 1) $\{(-5, -9)\}$
- 2) $\{(5, 21)\}$
- 3) $\{(0, 6), (-5, -9)\}$
- 4) $\{(0, 6), (5, 21)\}$

- 5 What is the solution to the system of equations $y = 3x - 2$ and $y = g(x)$ where $g(x)$ is defined by the function below?



- 1) $\{(0, -2)\}$
- 2) $\{(0, -2), (1, 6)\}$
- 3) $\{(1, 6)\}$
- 4) $\{(1, 1), (6, 16)\}$

6 The graph of a quadratic function is shown below.



When the graph of $x + y = 4$ is drawn on the same axes, one solution to this system is

- 1) (4,0)
- 2) (1,5)
- 3) (2,2)
- 4) (3,1)

7 The graphs of $y = x^2 - 3$ and $y = 3x - 4$ intersect at approximately

- 1) (0.38, -2.85), only
- 2) (2.62, 3.85), only
- 3) (0.38, -2.85) and (2.62, 3.85)
- 4) (0.38, -2.85) and (3.85, 2.62)

8 Algebraically determine the values of x that satisfy the system of equations below:

$$y = x^2 + 8x - 5$$

$$y = 8x - 4$$

9 Algebraically determine the values of x that satisfy the system of equations below.

$$y = -2x + 1$$

$$y = -2x^2 + 3x + 1$$

10 Algebraically determine the solution set for the system of equations below.

$$y = 2x^2 - 7x + 4$$

$$y = 11 - 2x$$

11 Consider the system shown below.

$$2x - y = 4$$

$$(x + 3)^2 + y^2 = 8$$

The two solutions of the system can be described as

- 1) both imaginary
- 2) both irrational
- 3) both rational
- 4) one rational and one irrational

12 Given $y = -2x$ and $x^2 + y^2 = 5$, the point of intersection in Quadrant II is

- 1) (1, -2)
- 2) (-2, 1)
- 3) (-1, 1)
- 4) (-1, 2)

- 13 What are the solution(s) to the system of equations shown below?

$$x^2 + y^2 = 5$$

$$y = 2x$$

- 1) $x = 1$ and $x = -1$
- 2) $x = 1$
- 3) $(1,2)$ and $(-1,-2)$
- 4) $(1,2)$, only

- 18 Solve the system of equations shown below algebraically.

$$(x - 3)^2 + (y + 2)^2 = 16$$

$$2x + 2y = 10$$

- 19 Algebraically solve the following system of equations.

$$(x - 2)^2 + (y - 3)^2 = 16$$

$$x + y - 1 = 0$$

- 14 Solve the system of equations algebraically:

$$x^2 + y^2 = 25$$

$$y + 5 = 2x$$

- 15 Solve the following system of equations algebraically. $x^2 + y^2 = 400$

$$y = x - 28$$

- 16 Algebraically solve the system:

$$(x - 2)^2 + (y - 3)^2 = 20$$

$$y = -2x + 7$$

- 17 Solve the system of equations shown below algebraically:

$$(x - 4)^2 + (y - 1)^2 = 9$$

$$x - y = 6$$

A.REI.C.7: Quadratic-Linear Systems 4 Answer Section

1 ANS: 4

$$\frac{1}{2}x^2 + 2x = \frac{1}{4}x - 8 \quad b^2 - 4ac$$

$$2x^2 + 8x = x - 32 \quad 7^2 - 4(2)(32) < 0$$

$$2x^2 + 7x + 32 = 0$$

REF: 012310aaii

2 ANS: 2

$$x^2 - 24 = x - 12 \quad y = -3 - 12 = -15$$

$$x^2 - x - 12 = 0$$

$$(x - 4)(x + 3) = 0$$

$$x = 4, -3$$

REF: 062404aaii

3 ANS: 2

$$x^2 + 4x - 1 = x - 3 \quad y + 3 = -1$$

$$x^2 + 3x + 2 = 0 \quad y = -4$$

$$(x + 2)(x + 1) = 0$$

$$x = -2, -1$$

REF: 061801aaii

4 ANS: 3

$$(x + 4)^2 - 10 = 3x + 6 \quad y = 3(-5) + 6 = -9$$

$$x^2 + 8x + 16 - 10 = 3x + 6 \quad y = 3(0) + 6 = 6$$

$$x^2 + 5x = 0$$

$$x(x + 5) = 0$$

$$x = -5, 0$$

REF: 061903aaii

5 ANS: 4

$$y = g(x) = (x-2)^2 \quad (x-2)^2 = 3x-2 \quad y = 3(6)-2 = 16$$

$$x^2 - 4x + 4 = 3x - 2 \quad y = 3(1) - 2 = 1$$

$$x^2 - 7x + 6 = 0$$

$$(x-6)(x-1) = 0$$

$$x = 6, 1$$

REF: 011705aai

6 ANS: 4

$$y = -(x-1)^2 + 5 \quad 3 + y = 4$$

$$4 - x = -x^2 + 2x - 1 + 5 \quad y = 1$$

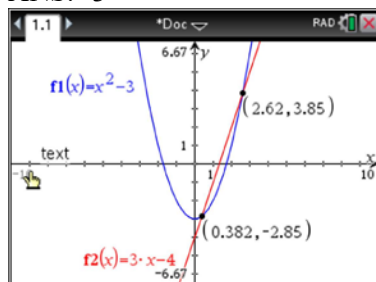
$$x^2 - 3x = 0$$

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

$$x = 0, 3$$

REF: 082305aai

7 ANS: 3



REF: 011810ai

8 ANS:

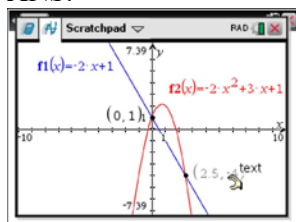
$$x^2 + 8x - 5 = 8x - 4$$

$$x^2 - 1 = 0$$

$$x = \pm 1$$

REF: 082326aai

9 ANS:



$$-2x + 1 = -2x^2 + 3x + 1$$

$$2x^2 - 5x = 0$$

$$x(2x - 5) = 0$$

$$x = 0, \frac{5}{2}$$

REF: fall1507aii

10 ANS:

$$2x^2 - 7x + 4 = 11 - 2x \quad y = 11 - 2\left(\frac{7}{2}\right) = 4 \quad \left\{ \left(\frac{7}{2}, 4\right), (-1, 13) \right\}$$

$$2x^2 - 5x - 7 = 0 \quad y = 11 - 2(-1) = 13$$

$$(2x - 7)(x + 1) = 0$$

$$x = \frac{7}{2}, -1$$

REF: 082232aii

11 ANS: 1

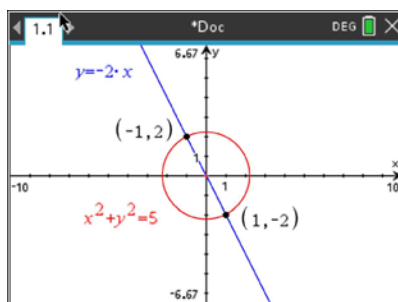
$$(x + 3)^2 + (2x - 4)^2 = 8 \quad b^2 - 4ac$$

$$x^2 + 6x + 9 + 4x^2 - 16x + 16 = 8 \quad 100 - 4(5)(17) < 0$$

$$5x^2 - 10x + 17 = 0$$

REF: 081719aii

12 ANS: 4



$$x^2 + (-2x)^2 = 5 \quad y = -2(-1) = 2$$

$$5x^2 = 5$$

$$x^2 = 1$$

$$x = \pm 1$$

REF: 012407aaii

13 ANS: 3

$$x^2 + (2x)^2 = 5 \quad y = 2x = \pm 2$$

$$x^2 + 4x^2 = 5$$

$$5x^2 = 5$$

$$x = \pm 1$$

REF: 081916aaii

14 ANS:

$$x^2 + (2x - 5)^2 = 25 \quad y + 5 = 2(0) \quad y + 5 = 2(4) \quad (0, -5), (4, 3)$$

$$x^2 + 4x^2 - 20x + 25 = 25 \quad y = -5 \quad y = 3$$

$$5x^2 - 20x = 0$$

$$5x(x - 4) = 0$$

$$x = 0, 4$$

REF: 062236aaii

15 ANS:

$$x^2 + (x - 28)^2 = 400 \quad y = 12 - 28 = -16 \quad y = 16 - 28 = -12$$

$$x^2 + x^2 - 56x + 784 = 400$$

$$2x^2 - 56x + 384 = 0$$

$$x^2 - 28x + 192 = 0$$

$$(x - 16)(x - 12) = 0$$

$$x = 12, 16$$

REF: 081831aaii

16 ANS:

$$(x-2)^2 + (-2x+7-3)^2 = 20 \quad y = -2(0)+7 = 7 \quad (0,7), (4,-1)$$

$$(x-2)^2 + (-2x+4)^2 = 20 \quad y = -2(4)+7 = -1$$

$$x^2 - 4x + 4 + 4x^2 - 16x + 16 = 20$$

$$5x^2 - 20x = 0$$

$$5x(x-4) = 0$$

$$x = 0, 4$$

REF: 062335aaii

17 ANS:

$$(x-4)^2 + ((x-6)-1)^2 = 9 \quad 7-y = 6 \quad 4-y = 6 \quad (7,1), (4,-2)$$

$$x^2 - 8x + 16 + x^2 - 14x + 49 - 9 = 0 \quad 1 = y \quad -2 = y$$

$$2x^2 - 22x + 56 = 0$$

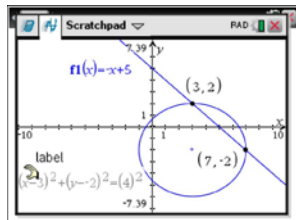
$$x^2 - 11x + 28 = 0$$

$$(x-7)(x-4) = 0$$

$$x = 7, 4$$

REF: 082436aaii

18 ANS:



$$y = -x + 5 \quad y = -7 + 5 = -2$$

$$(x-3)^2 + (-x+5+2)^2 = 16 \quad y = -3 + 5 = 2$$

$$x^2 - 6x + 9 + x^2 - 14x + 49 = 16$$

$$2x^2 - 20x + 42 = 0$$

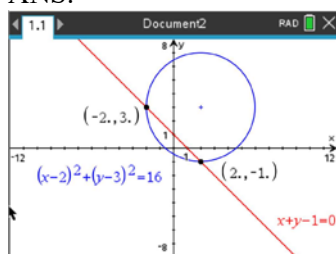
$$x^2 - 10x + 21 = 0$$

$$(x-7)(x-3) = 0$$

$$x = 7, 3$$

REF: 061633aaii

19 ANS:



$$y = -x + 1 \quad y = -2 + 1 = -1 \quad (2, -1)$$

$$(x - 2)^2 + (-x + 1 - 3)^2 = 16 \quad y = 2 + 1 = 3 \quad (-2, 3)$$

$$x^2 - 4x + 4 + x^2 + 4x + 4 = 16$$

$$2x^2 = 8$$

$$x = -2, 2$$

REF: 012035a11