

A.REI.C.7: Quadratic-Linear Systems 5b

1 What is the total number of points of intersection in the graphs of the equations $x^2 + y^2 = 16$ and $y = 4$?

2 The graphs of the equations $x^2 + y^2 = 4$ and $y = x$ are drawn on the same set of axes. What is the total number of points of intersection?

3 What is the total number of points of intersection of the graphs of the equations $x^2 + y^2 = 16$ and $y = x$?

4 Consider the system shown below.

$$2x - y = 4$$

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

The two solutions of the system can be described as

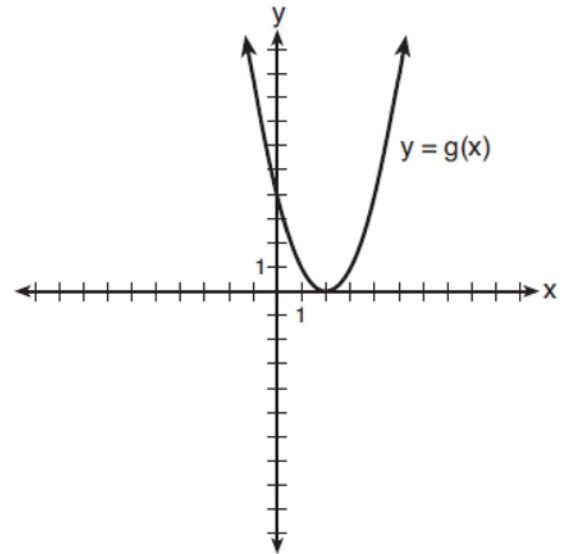
- 1) both imaginary
- 2) both irrational
- 3) both rational
- 4) one rational and one irrational

5 The equations $x^2 + y^2 = 25$ and $y = 5$ are graphed on a set of axes. What is the solution of this system?

6 Which ordered pair is a solution of the system of equations shown below? $x + y = 5$

$$(x + 3)^2 + (y - 3)^2 = 53$$

7 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?



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

$$y = -2x + 1$$

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

9 Solve the following systems of equations algebraically: $5 = y - x$

$$4x^2 = -17x + y + 4$$

10 Solve: $x^2 + y^2 = 5$

$$x + y = 3$$

11 Solve: $x^2 + y^2 = 17$

$$x + y = 5$$

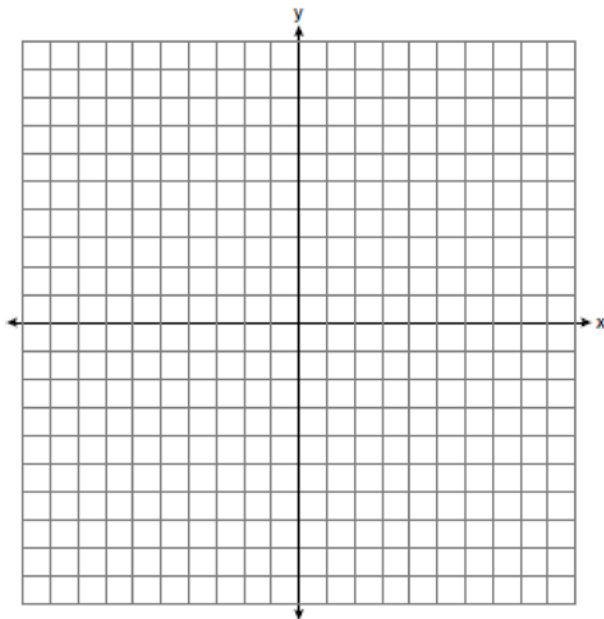
12 Solve: $x + y = 1$
 $x^2 + y^2 = 61$

13 Solve the system of equations shown below algebraically.

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

$$2x + 2y = 10$$

14 On the set of axes provided below, sketch a circle with a radius of 3 and center at (2, 1) and also sketch the graph of the line $2x + y = 8$.

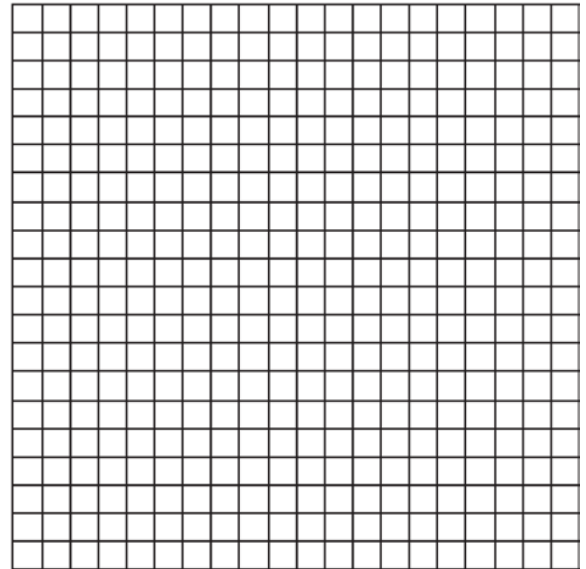


What is the total number of points of intersection of the two graphs?

15 Solve the following system of equations algebraically or graphically: $x^2 + y^2 = 25$

$$3y - 4x = 0$$

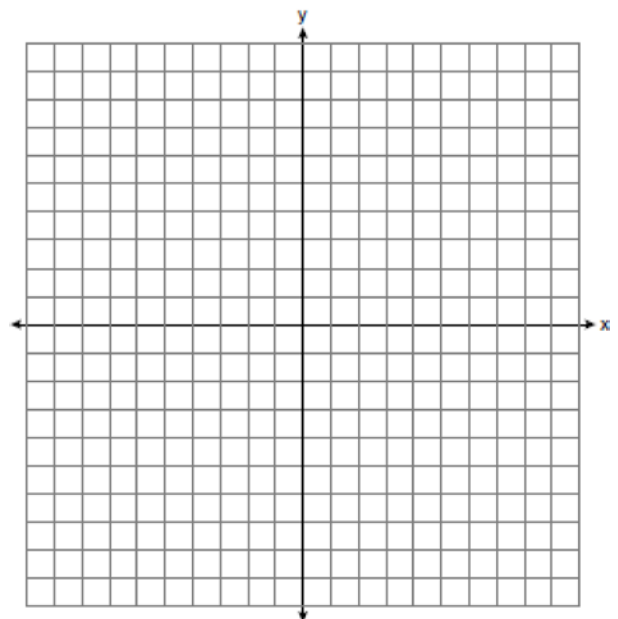
[The use of the accompanying grid is optional.]



16 On the set of axes below, solve the following system of equations graphically and state the coordinates of *all* points in the solution.

$$(x + 3)^2 + (y - 2)^2 = 25$$

$$2y + 4 = -x$$



A.REI.C.7: Quadratic-Linear Systems 5b Answer Section

1 ANS:

1

$$x^2 + y^2 = 16$$

$$x^2 + 4^2 = 16 \quad \cdot (0,4)$$

$$x^2 + 16 = 0$$

$$x = 0$$

REF: 060119a

2 ANS:

2

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

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

$$2x^2 = 4 \quad \cdot (\sqrt{2}, \sqrt{2}), (-\sqrt{2}, -\sqrt{2})$$

$$x^2 = 2$$

$$x = \pm\sqrt{2}$$

REF: 010920a

3 ANS:

2

$$x^2 + y^2 = 16$$

$$x^2 + x^2 = 16$$

$$2x^2 = 16 \quad \cdot (\sqrt{8}, \sqrt{8}) \text{ and } (-\sqrt{8}, -\sqrt{8})$$

$$x^2 = 8$$

$$x = \pm\sqrt{8}$$

REF: 080625a

4 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: 081719aaii

5 ANS:

(0,5)

$$x^2 + 5^2 = 25$$

$$x = 0$$

REF: 011312ge STA: G.G.70

6 ANS:

(-5,10)

$$x + y = 5 \quad . \quad -5 + y = 5$$

$$y = -x + 5 \quad y = 10$$

$$(x + 3)^2 + (-x + 5 - 3)^2 = 53$$

$$x^2 + 6x + 9 + x^2 - 4x + 4 = 53$$

$$2x^2 + 2x - 40 = 0$$

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

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

$$x = -5, 4$$

REF: 011302a2 STA: A2.A.3

7 ANS:

{(1,1),(6,16)}

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

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

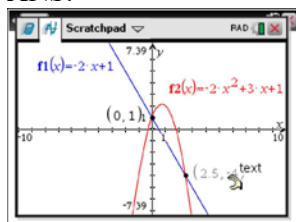
$$x^2 - 7x + 6 = 0$$

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

$$x = 6, 1$$

REF: 011705aaii

8 ANS:



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

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

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

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

REF: fall1507aii

9 ANS:

$$\left(-\frac{9}{2}, \frac{1}{2}\right) \text{ and } \left(\frac{1}{2}, \frac{11}{2}\right). \quad y = x + 5 \quad . \quad 4x^2 + 17x - 4 = x + 5$$

$$y = 4x^2 + 17x - 4 \quad 4x^2 + 16x - 9 = 0$$

$$(2x + 9)(2x - 1) = 0$$

$$x = -\frac{9}{2} \text{ and } x = \frac{1}{2}$$

$$y = -\frac{9}{2} + 5 = \frac{1}{2} \text{ and } y = \frac{1}{2} + 5 = \frac{11}{2}$$

REF: 061139a2 STA: A2.A.3

10 ANS:

(2, 1) and (1, 2)

REF: 119409a1

11 ANS:

(4, 1) and (1, 4)

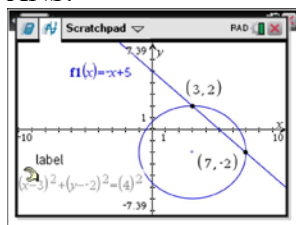
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12 ANS:

(6, -5) and (-5, 6)

REF: 010015a1

13 ANS:



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

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

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

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

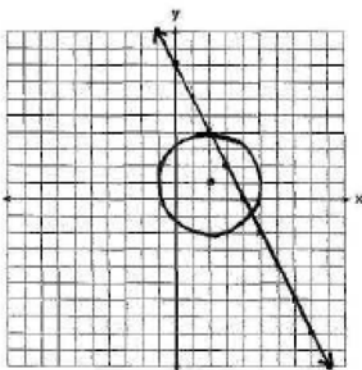
$$x^2 - 10x + 21 = 0$$

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

$$x = 7, 3$$

REF: 061633aii

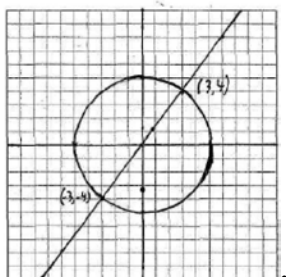
14 ANS:



a) ; b) 2

REF: 010029a

15 ANS:



$$x^2 + \left(\frac{4}{3}x\right)^2 = 25$$

$$x^2 + \frac{16}{9}x^2 = 25$$

$$\frac{25}{9}x^2 = 25 \quad y = \frac{4}{3}(3) = 4$$

$$x^2 = 9 \quad = \frac{4}{3}(-3) = -4$$

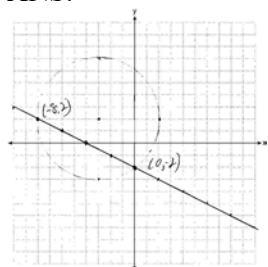
$$x = \pm 3$$

$$3y - 4x = 0$$

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

REF: 060439a

16 ANS:



REF: 081237ge STA: G.G.70