

Name: Key

Date: \_\_\_\_\_

### Solving Systems of Quadratic Equations

1.  $y = x^2 - 5x + 7$   
 $y = 2x + 1$

$$x^2 - 5x + 7 = 2x + 1 \quad y = 2(6) + 1$$

$$x^2 - 7x + 6 = 0 \quad y = 13$$

$$(x-6)(x-1) = 0 \quad y = 2(1) + 1$$

$$x = 6, 1 \quad y = 3$$

$(6, 13) (1, 3)$

2.  $y = 2x + 3$   
 $y = 3x^2 - 5$

$$3x^2 - 5 = 2x + 3 \quad y = 2(-\frac{4}{3}) + 3$$

$$3x^2 - 2x - 8 = 0 \quad y = -\frac{8}{3} + 3$$

$$(3x+4)(x-2) = 0 \quad y = \frac{1}{3}$$

$$x = -\frac{4}{3}, 2 \quad y = 2(2) + 3$$

$$y = 7$$

$(-\frac{4}{3}, \frac{1}{3}) (2, 7)$

3.  $y = 2x^2 - 14x - 44$   
 $y = -14x - 26$

$$2x^2 - 14x - 44 = -14x - 26 \quad y = -14(3) - 26$$

$$2x^2 - 18 = 0 \quad y = -68$$

$$2(x^2 - 9) = 0 \quad y = -14(-3) - 26$$

$$2(x+3)(x-3) = 0 \quad y = 16$$

$$x = 3, -3$$

$(3, -68) (-3, 16)$

4.  $y = -6x + 2$   
 $y = x^2 + 11$

$$x^2 + 11 = -6x + 2 \quad y = -6(-3) + 2$$

$$x^2 + 6x + 9 = 0 \quad y = 20$$

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

$$x = -3$$

$(-3, 20)$

5.  $x + (y) = 12$

$$y = 5x^2 - 20x + 8 \quad y = 12 + \frac{1}{5}$$

$$x + 5x^2 - 20x + 8 = 12 \quad y = 12 - 4$$

$$5x^2 - 19x - 4 = 0$$

$$(5x+1)(x-4) = 0$$

$$x = -\frac{1}{5}, 4$$

$(-\frac{1}{5}, \frac{61}{5}) (4, 8)$

6.  $3x - 4(y) = 12$   
 $y = x^2 - 16$

$$3x - 4(x^2 - 16) = 12$$

$$3x - 4x^2 + 64 = 12$$

$$-4x^2 + 3x + 52 = 0$$

$$4x^2 - 3x - 52 = 0$$

$$(4x+13)(x-4) = 0$$

$$x = -\frac{13}{4}, 4$$

$$y = (-\frac{13}{4})^2 - 16$$

$$y = 16 - 16$$

$(-\frac{13}{4}, -\frac{87}{16}) (4, 0)$

7.  $y = 5x - 3$

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

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

$$x^2 - 2x + 1 = 0$$

$$(x-1)^2 = 0$$

$$x = 1$$

$(1, 2)$

8.  $5x - 4(y) - 22 = 0$   
 $y = -3x^2 + 4$

$$5x - 4(-3x^2 + 4) - 22 = 0$$

$$5x + 12x^2 - 16 - 22 = 0$$

$$12x^2 + 5x - 38 = 0$$

$$(x+2)(12x-19) = 0$$

$$x = -2, \frac{19}{12}$$

$$y = -3(-2)^2 + 4$$

$$y = -12 + 4$$

$$y = -8$$

$$y = -3(\frac{19}{12})^2 + 4$$

$(-2, -8) (\frac{19}{12}, -\frac{167}{48})$

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9.  $y = x^2 - 5x + 7$   
 $y - x^2 = 7 - 5x$   
 $4y - 8x = -21$        $4y - 8(\frac{7}{2}) = -21$   
 $4(x^2 - 5x + 7) - 8x = -21$        $4y - 28 = -21$   
 $4x^2 - 20x + 28 - 8x = -21$        $4y = 7$   
 $4x^2 - 28x + 49 = 0$        $y = \frac{7}{4}$   
 $(2x - 7)^2 = 0$   
 $x = \frac{7}{2}$        $(\frac{7}{2}, \frac{7}{4})$

10.  $x^2 + y^2 = 25$   
 $3y - 2x = 6$   
 $y = \frac{2x+6}{3}$   
 $y = \frac{2}{3}x + 2$   
 $x^2 + (\frac{2}{3}x + 2)^2 = 25$   
 $x^2 + \frac{4}{9}x^2 + \frac{8}{3}x + 4 = 25$   
 $9(\frac{13}{9}x^2 + \frac{8}{3}x - 21) = 0$   
 $13x^2 + 24x - 189 = 0$   
 $(x-3)(13x+63) = 0$   
 $x = 3, -\frac{63}{13}$   
 $(3, 4) (-\frac{63}{13}, -\frac{16}{13})$

11.  $y = x^2 + 4x + 3$   
 $y = 2x + 6$        $y = 2(3) + 6$   
 $x^2 + 4x + 3 = 2x + 6$        $y = 0$   
 $x^2 + 2x - 3 = 0$        $y = 2(1) + 6$   
 $(x+3)(x-1) = 0$        $y = 8$   
 $x = -3, 1$        $(-3, 0) (1, 8)$

12.  $x^2 + y^2 = 25$   
 $x - y = 5$   
 $x = y + 5$   
 $(y+5)^2 + y^2 = 25$   
 $y^2 + 10y + 25 + y^2 = 25$   
 $2y^2 + 10y = 0$   
 $2y(y+5) = 0$   
 $y = 0, -5$   
 $x = 5$   
 $x = -5 + 5$   
 $(5, 0) (0, -5)$

13.  $x^2 + y^2 = 13$   
 $y = x + 1$   
 $x^2 + (x+1)^2 = 13$        $y = -3 + 1$   
 $x^2 + x^2 + 2x + 1 = 13$        $y = 2 + 1$   
 $2x^2 + 2x - 12 = 0$   
 $x^2 + x - 6 = 0$   
 $(x+3)(x-2) = 0$        $(-3, -2) (2, 3)$   
 $x = -3, 2$

14.  $x^2 + 4y^2 - 4 = 0$   
 $-2y^2 + x + 2 = 0$   
 $2y^2 = x + 2$   
 $x^2 + 2(x+2) - 4 = 0$   
 $x^2 + 2x + 4 - 4 = 0$   
 $x^2 + 2x = 0$   
 $x(x+2) = 0$   
 $x = 0, -2$   
 $2y^2 = 0 + 2$   
 $y^2 = 1$   
 $y = \pm 1$   
 $-2y^2 = -2 + 2$   
 $-2y^2 = 0$   
 $y = 0$   
 $(0, 1) (-2, 0)$   
 $(0, -1)$

15.  $x^2 + y^2 - 16x + 39 = 0$   
 $+ x^2 - y^2 - 9 = 0$   
 $2x^2 - 16x + 30 = 0$        $9 - y^2 - 9 = 0$   
 $x^2 - 8x + 15 = 0$        $y^2 = 0$   
 $(x-3)(x-5) = 0$        $y = 0$   
 $x = 3, 5$        $25 - y^2 - 9 = 0$   
 $16 - y^2 = 0$   
 $y = \pm 4$   
 $(3, 0)$   
 $(5, 4)$   
 $(5, -4)$