

Solving Linear-Quadratic Systems in Two Variables

1. Determine whether each ordered pair is a solution of the system of equations.

a) $y = -2x^2 + 10$
 $2y = x + 15$
 $(1, 8)$

b) $y = \frac{1}{3}x^2 - 3$
 $x + y + 3 = 0$
 $(-3, -3)$

2. Solve the following systems of equations algebraically. Use the quadratic formula to solve where necessary and round answers to two decimal places.

a) $y = x^2$
 $5x + y = 0$

b) $y = x^2 + 3x$
 $y = 2x + 6$

c) $y = x^2 - 5x$
 $3x + y = 3$

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

e) $y = 4x + 3$
 $y = 2x^2 + 8x + 3$

f) $y = -2x^2 + 3x + 4$
 $-3x + y - 4 = 0$

g) $x^2 + 4x - y + 6 = 0$
 $2x + y = -2$

h) $-x^2 + 12x - 2y = 8$
 $3x - y = 0$

i) $6x^2 - 25x - 2y + 28 = 0$
 $x + 2y = 4$

j) $y = 2x^2 + 3$
 $y = -3x + 5$

k) $x - 2y = 3$
 $y = 2x^2 + 7x - 1$

3. Solve the following systems of equations using graphing technology. Answer rounded to two decimal places.

a) $y = -3x^2 + 2x - 5$
 $y = \frac{1}{2}x - 8$

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

4. The perimeter of a rectangle is 13 cm and its area is 10 cm^2 . Find its length and width.
5. The difference of two integers is 7. The square of the smaller integer subtract the larger integer equals 5. Find the integers.
6. Two integers are related this way: The first integer plus the second integer is 21. Fifteen less than double the square of the first integer equals the second integer. Find the integers.
7. A movie stunt woman jumps from a cliff and falls freely for several seconds before releasing her parachute. Her height h metres t seconds after jumping is given by $h = -4.9t^2 + t + 350$ before she released her parachute, and $h = -4t + 141$ after she released her parachute.
 - a) How long after jumping did she release her parachute?
 - b) How high was she when she released her parachute?

ANSWERS

- 1a) *Yes*
- 1b) *No*
- 2a) $(0,0), (-5,25)$
- 2b) $(-3,0), (2,10)$
- 2c) $(-1,6), (3,-6)$
- 2d) $(2,16), (4,36)$
- 2e) $(-2,-5), (0,3)$
- 2f) $(0,4)$
- 2g) $(-4,6), (-2,2)$
- 2h) $(2,6), (4,12)$
- 2i) $(2,1)$
- 2j) $(0.5,3.5), (-2,11)$
- 2k) $(-0.08,-1.54), (-3.17,-3.09)$
- 3a) $(-0.78,-8.39), (1.28,-7.36)$
- 3b) $(-0.48,6.91), (0.70,2.20)$
- 4) $l = 4 \text{ cm}, w = 2.5 \text{ cm}$
- 5) $(-3,4), (4,11)$
- 6) $(4,17)$
- 7a) 7.1 s
- 7b) 113 m