ALBERT

Name _____ Date _____

Linear-Quadratic Systems Worksheet

Algebra 1 · Common Core HSA-REI.C.7

> Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line $y = -3x$ and the circle $x^2 + y^2 = 3$.

Practice

Builds the skill step by step.

1. Solve the system $y = x^2$ and $y = 4$. List the points from left to right.

2. Solve the system $y = x^2$ and $y = x$. List the points from left to right.

3. Solve the system $y = x^2 - 1$ and $y = 3$. List the points from left to right.

4. How many points can a line and a parabola have in common?

   A. Only 1

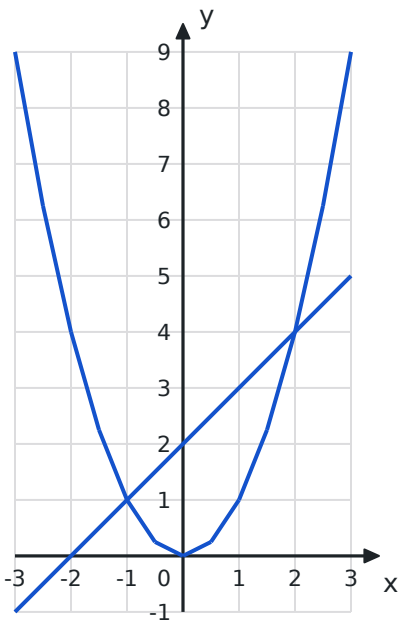
   B. 0, 1 or 2

   C. Only 2

   D. Any number

5. Solve the system $y = x^2 + 2$ and $y = 3x$. List the points from left to right.

6. The graph shows $y = x^2$ and $y = x + 2$. Find the points where they cross. List them from left to right.



7. How many solutions does the system $y = x^2$ and $y = -1$ have?

   A. One

   B. Two

   C. Infinitely many

   D. None

8. Solve the system $y = x^2 - 4x + 4$ and $y = 0$.

9. Solve the system $y = 2x^2$ and $y = 8$. List the points from left to right.

10. Solve the system $y = x^2$ and $y = 2x - 1$.

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On Level

Grade-level practice.

1. Solve the system $y = x^2 - 2x - 3$ and $y = x + 1$. List the points from left to right.

2. Solve the system $y = x^2 + 1$ and $y = -x + 7$. List the points from left to right.

3. How many solutions does the system $y = x^2 + 3$ and $y = 2x$ have?

   A. One

   B. Two

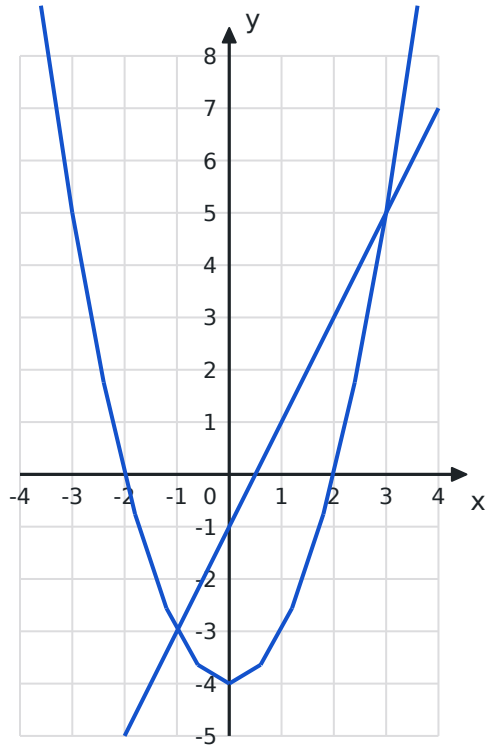
   C. None

   D. Infinitely many

4. Solve the system $y = -x^2 + 4$ and $y = x + 2$. List the points from left to right.

5. Solve the system $x^2 + y^2 = 25$ and $y = x + 1$. List the points from left to right.

6. The graph shows $y = x^2 - 4$ and $y = 2x - 1$. Find the points where they cross. List them from left to right.



7. For which value of b does the line $y = 2x + b$ touch the parabola $y = x^2$ at exactly one point?

   A. 0

   B. 1

   C. 2

   D. -1

8. A ball's height in meters after t seconds is $h = -t^2 + 6t$. A drone's height is $h = t + 4$. At what times are they at the same height? List the times from first to last.

9. Solve the system $y = 2x^2 - 3x$ and $y = x + 6$. List the points from left to right.

10. Solve the system $y = x^2$ and $y = 6 - x$. List the points from left to right.

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Challenge

Multi-step and word problems that stretch it.

1. Solve the system $x^2 + y^2 = 10$ and $y = 3x$. List the points from left to right.

2. Find where the line $y = -3x$ meets the circle $x^2 + y^2 = 3$. Round each coordinate to the nearest hundredth and list the points from left to right.

3. For which values of k does the line $y = k$ cross the parabola $y = x^2 - 6x + 5$ at two points?

   A. $k < -4$

   B. $k = -4$

   C. $k > -4$

   D. $k > 5$

4. Solve the system $y = x^2 + 4x$ and $y = 2x + 3$. List the points from left to right.

5. Dev solves $y = x^2$ and $y = x + 6$ and finds $x = -2$ and $x = 3$. He reports $(-2, -4)$ and $(3, 9)$. What is wrong?

   A. The y-value for $x = -2$ should be 4, so the point is $(-2, 4)$.

   B. The x-values should be 2 and -3.

   C. Nothing is wrong.

   D. He should report only $(3, 9)$.

6. Solve the system $y = x^2 - 5$ and $y = -2x + 3$. List the points from left to right.

7. A rectangle has a perimeter of 20 meters and an area of 21 square meters. Find its two side lengths, shorter first.

8. Solve the system $y = -x^2 + 2x + 8$ and $y = 2x + 4$. List the points from left to right.

9. How many solutions does the system $x^2 + y^2 = 4$ and $y = 3$ have?

   A. One

   B. None

   C. Two

   D. Four

10. Solve the system $y = 0.5x^2$ and $y = x + 4$. List the points from left to right.