

# Solving Linear-Quadratic Systems

Algebra 1 • Section 6.6

Name: \_\_\_\_\_

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

Score: \_\_\_\_\_ / 12

## Quick Review and Helpful Hints

A system asks for values that satisfy every relationship at the same time. The solution may be one point, no point, or infinitely many points, depending on how the graphs or equations meet.

▷ **Example:** Solve  $y = x + 4$  and  $y = 10$ .

**Work:** Substitute 10 for  $y$ :  $10 = x + 4$ , so  $x = 6$ . The solution is the point where both equations agree.

★ **Answer:** (6, 10)

## ◆ Practice Problems

Solve each problem. Show enough work that another student could follow your thinking.

1. Solve  $y = x^2$  and  $y = 4$ .

\_\_\_\_\_

2. Solve  $y = x^2 + 1$  and  $y = 10$ .

\_\_\_\_\_

3. Solve  $y = x^2$  and  $y = x + 2$ .

\_\_\_\_\_

4. Solve  $y = x^2 - 4$  and  $y = 0$ .

\_\_\_\_\_

5. Solve  $y = -x^2 + 9$  and  $y = 5$ .

\_\_\_\_\_

6. Solve  $y = x^2 + 2x$  and  $y = 0$ .

\_\_\_\_\_

7. Solve  $y = x^2$  and  $y = 2x + 3$ .

\_\_\_\_\_

8. How many intersections can a line and parabola have?

\_\_\_\_\_

9. Solve  $y = x^2 - 1$  and  $y = 3$ .

\_\_\_\_\_

10. Solve  $y = 2x^2$  and  $y = 8$ .

\_\_\_\_\_

## ◆ Word Problems

11. A ball height is  $h = -t^2 + 4t + 5$  and a platform is at  $h = 5$ . When do they meet?

\_\_\_\_\_

12. A parabola  $y = x^2$  and line  $y = 6x - 8$  model two paths. Find intersections.

\_\_\_\_\_



## Answer Keys

- $(-2, 4)$  and  $(2, 4)$
- $(-3, 10)$  and  $(3, 10)$
- $(-1, 1)$  and  $(2, 4)$
- $(-2, 0)$  and  $(2, 0)$
- $(-2, 5)$  and  $(2, 5)$
- $(-2, 0)$  and  $(0, 0)$
- $(-1, 1)$  and  $(3, 9)$
- $0, 1,$  or  $2$
- $(-2, 3)$  and  $(2, 3)$
- $(-2, 8)$  and  $(2, 8)$
- $t = 0$  and  $t = 4$
- $(2, 4)$  and  $(4, 16)$

### Step-by-Step Explanations

- Both equal  $y$ , so  $x^2 = 4$  — and squaring either  $-2$  or  $2$  lands you on  $4$ .
- Where they meet,  $x^2 + 1 = 10$ , so peel off the  $1$  to find  $x^2 = 9$ .
- Match the  $y$ 's:  $x^2 = x + 2$ . Slide everything left and factor to catch both crossings.
- Setting  $y = 0$  asks where the parabola hits the  $x$ -axis, so solve  $x^2 = 4$ .
- Equal heights mean  $-x^2 + 9 = 5$ ; tidy it up and  $x^2 = 4$  pops right out.
- A product equals zero only when a piece is zero, so factor  $x(x + 2)$  and read off both roots.
- Curve meets line when  $x^2 = 2x + 3$ ; move it all to one side and the quadratic gives two answers.
- Picture sliding a line across a parabola — it can sail past, just graze it, or slice clean through twice.
- At the meeting point  $x^2 - 1 = 3$ ; add the  $1$  back over and you get  $x^2 = 4$ .
- Equal  $y$ -values give  $2x^2 = 8$ ; divide by  $2$  first and  $x^2 = 4$  is left.
- The ball is level with the platform when  $-t^2 + 4t = 0$ ; factor out  $-t$  to find both times.
- The paths cross where  $x^2 = 6x - 8$ ; gather terms and factor to find the two spots they share.



## Want Even More Algebra 1 Practice?



### Arizona Algebra I Preparation Bundle

18 full-length practice tests across three books  
Fresh test practice, detailed explanations, and  
organized review



**18 Tests**  
**3 Books**  
**One Bundle**

**Important:** These Algebra 1 resources are made for extra practice after the worksheet. Use the QR code for the state or program bundle connected with this worksheet.

#### Skill Review

- ✓ Strengthens equations, functions, systems, and modeling
- ✓ Supports steady review before tests
- ✓ Good for tutoring, homework, and independent practice

**Build the foundation.**

#### Test Practice

- ✓ Full-length practice tests for realistic pacing
- ✓ Detailed answer explanations for every test
- ✓ Useful after students finish topic worksheets

**Practice with purpose.**

#### Confidence

- ✓ Turns mistakes into targeted review
- ✓ Helps students see progress over time
- ✓ Keeps preparation organized and calm

**Move forward prepared.**