

Solving Quadratic Equations Four Ways

Grade 9 – Algebra 1 math · Test · Standards: A-REI.B.4a, A-REI.B.4b, A-APR.B.3, A-CED.A.1

Name: _____ Date: _____ Class: _____

This test has 8 questions worth 20 points. Allow 45 minutes and work without notes. A calculator may be used for square roots. Show every step, because partial credit is given for correct setups and intermediate results.

Standards: A-REI.B.4a, A-REI.B.4b, A-APR.B.3, A-CED.A.1 · **Level:** Grade 9 Algebra 1

Time: 45 minutes · 8 questions · Total: 20 points · Calculator: as allowed by your teacher

Question 1 Square Roots (2 points)

Solve $2(x + 3)^2 = 50$.

Question 2 Factoring (2 points)

Solve each equation.

- a. $x^2 + 11x + 28 = 0$ (1 point)
- b. $3x^2 - 12x = 0$ (1 point)

Question 3 Complete the Square (3 points)

Solve $x^2 + 10x + 7 = 0$ by completing the square. Give exact answers and decimals rounded to the nearest hundredth.

Question 4 Quadratic Formula (3 points)

Solve $2x^2 - 3x - 7 = 0$ with the quadratic formula. Round to the nearest hundredth.

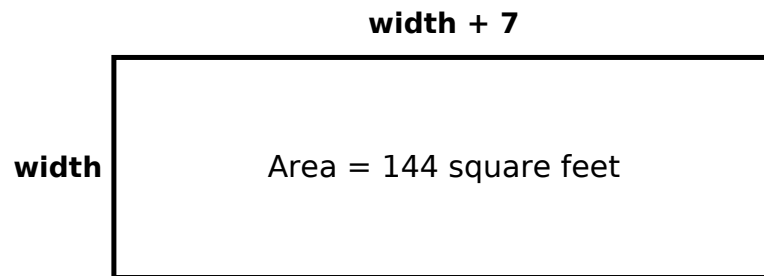
Question 5 Discriminant (2 points)

Use the discriminant to decide how many real solutions each equation has.

- a. $3x^2 - 6x + 4 = 0$ (1 point)
- b. $x^2 + 6x + 9 = 0$ (1 point)

Question 6 Garden Dimensions (3 points)

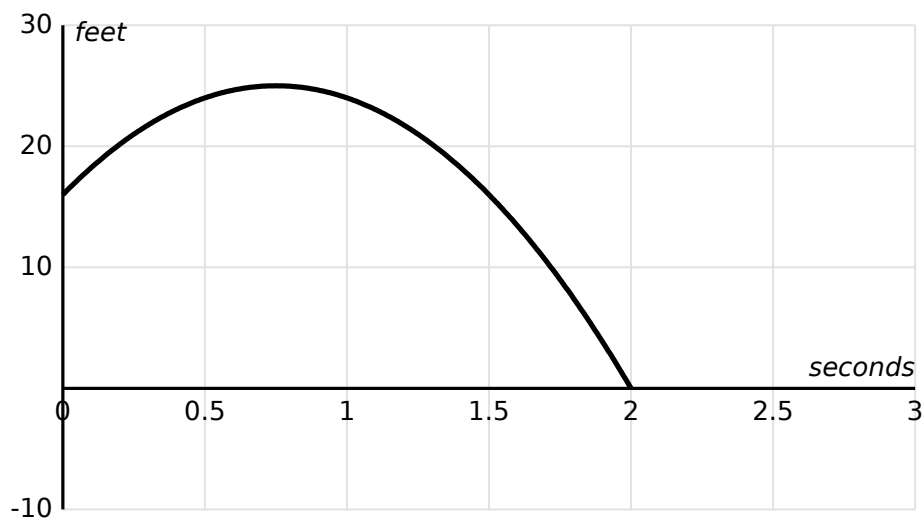
A rectangular garden is 7 feet longer than it is wide and has an area of 144 square feet. Find its width and length.



A rectangular garden.

Question 7 When Does the Ball Land? (3 points)

The height of a ball is $h(t) = -16t^2 + 24t + 16$ feet after t seconds, as graphed.



Height of a ball over time.

- Write the equation that gives the landing time. (1 point)
- Solve it by factoring or by another method. (1 point)
- Say which solution makes sense and why. (1 point)

Question 8 Zero-Product Property (2 points)

Solve $(2x - 5)(x + 8) = 0$. Explain why each factor can be set equal to zero.