

Math 2 Unit 11 Worksheet 5
Quadratic Formula and Applications

Name: _____
Date: _____ **Per:** _____

[1-4] Solve using the quadratic formula. Simplify answers in decimal form to the nearest hundredth.

1. $3x^2 - 10x - 8 = 0$

2. $3p^2 - 5p + 8 = 6$

3. $x^2 - 2x - 4 = 2x - 1$

4. $x^2 - 10x + 13 = 0$

[5-8] Find the axis of symmetry and the vertex for each parabola.

5. $y = x^2 - 8x + 2$

Vertex: _____

AOS: _____

6. $y = -2x^2 + 12x - 13$

Vertex: _____

AOS: _____

7. $f(x) = -2x^2 + 4x + 5$

Vertex: _____

AOS: _____

8. $g(x) = 3x^2 - 12x + 5$

Vertex: _____

AOS: _____

[9-13] Solve the following word problems. Include the correct units in your answers.

9. The profit from a t-shirt sale fundraiser depends on the t-shirt price and can be modeled by $P = -15t^2 + 600t + 50$, where t is the price per t-shirt and P is the profit, both measured in dollars.

a) What t-shirt price yields the maximum profit?

b) What is the maximum profit?

10. A ball is thrown vertically upward with an initial velocity of 48 feet per second. If the ball started its flight at a height of 8 feet, then its height h at time t can be determined by the function $h = -16t^2 + 64t + 8$ where h is measured in feet above ground level and t is the number of seconds of flight.

a) What is the height of the ball at 1 second?

e) Sketch the graph of the function below.

Label points that correspond to answers from parts a, b, c, and d.

b) What is the height of the ball at 3 seconds?

c) Determine the maximum height the ball attains.



d) When does the ball hit the ground? Round answer to the nearest tenth of a second.

f) Label the y -intercept on the graph above.

What would the y -intercept represent in this situation?

11. A projectile is launched vertically from the top of a tower at a velocity of 80 feet per second. The tower is 200 feet high. The height of the projectile above the ground ' t ' seconds after launch is given by the function $h(t) = -16t^2 + 80t + 200$.

a) What is the maximum height achieved by the projectile?

b) How long after firing does it reach its maximum height?

12. A ball is thrown vertically into the air with an initial velocity of 64 feet per second. The function $y = -16t^2 + 64t$ gives its height above the ground after ' t ' seconds.

a) What is its height after 1.5 seconds?

c) When will the ball hit the ground?

b) What is its maximum height?