

Name:

Date:

Hour:

Algebra 1  
Unit 9B Test Review

I. Solving by factoring – Find the zeros of each function.

1.  $5x^2 - 15 = -10x$

2.  $4x^2 = 16x$

3.  $3x^2 + 9x = 12$

4.  $6x^2 = 6$

5.  $6x^2 + 23x = 4$

6.  $-3x^2 + 27 = 0$

II. Solve using the quadratic formula – Find the roots of each equation.

7.  $4x^2 - 8x = 3$

8.  $2x^2 + 8x = 1$

9.  $2x^2 = 8x - 3$

10.  $2x^2 + 7 = 10x$

III. Application Problems

11. The height in feet that a football is kicked can be modeled by the function

$$f(x) = -16x^2 + 64x.$$

a) What is the maximum height the football will reach?

b) How long is the football in the air?

12. As Molly dives into her pool, her height above the water can be modeled by the function

$f(x) = -16x^2 + 72x$ , where  $x$  is the time in seconds after she begins diving. How long does it take Molly to reach the pool?

13. An Olympic diver's height can be modeled by the function  $f(x) = -3x^2 + 6x + 24$ , where  $x$  is the time in seconds after he begins the dive. How long does it take the diver to hit the water?

14. A diver begins on a platform 11 meters above the surface of the water. The diver's height is given by the equation  $h(t) = -2t^2 + t + 11$ , where  $t$  is the time in seconds after the diver jumps. How long does it take the diver to reach a point one meter above the water?

15. The height in feet of a soccer ball kicked upward from the ground with initial velocity 60 feet per second is modeled by  $h = -16t^2 + 60t$ , where  $t$  is the time in seconds. Find the time it takes for the ball to return to the ground. Round to the nearest tenth of a second.

16. For a scene in a movie, a sack of money is dropped from a roof of a 576 ft skyscraper. The height of the sack above the ground is given by  $h = -16t^2 + 576$ , where  $t$  is the time in seconds. How long will it take the sack to reach the ground? Round to the nearest tenth of a second.
17. The height of a pumpkin launched from a cannon is given by the function  $h = -16t^2 + 224t + 240$ , where  $t$  is the time in seconds. How many seconds is the pumpkin in the air? Round your answer to the nearest tenth of a second.
18. A rock is thrown from the top of a tall building. The distance, in feet, between the rock and the ground  $x$  seconds after it is thrown is given by  $f(x) = -16x^2 - 4x + 382$ . How long after the rock is thrown is it 340 feet from the ground?
19. A football is being punted and the height of the ball can be modeled by the equation  $h = -16t^2 + 32t + 5$ , where  $h$  is the height in feet and  $t$  is the time in seconds. What is the initial height of the football?