Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period \_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_

**Advanced Functions and Modeling Unit 4 Review**

**Evaluate the expression. Round to the nearest ten-thousandth.**

1. 2. 3.

**Write the equation in logarithmic form.**

4. 5. 6.

**Write the equation in exponential form.**

7. 8. 9.

**Rewrite the expression as a single logarithm.**

10. 11. 12.

**Expand the expression.**

13. 14. 15.

**Solve each equation. Round your answer to four decimal places.**

16. 17. 18.

19. 20.

**Solve without logs.**

21. 22.

**Describe the transformation that took place given the parent function .**

23. 24. .

**Given the parent function , rewrite the equation to fit the transformation described below.**

25. left 6, up 4 26. Reflected over the x-axis, right 2, down 1

**Make a table of values for each function and graph.**

27. 28.

**Applications: Write an equation and solve for each scenario.**

29. A sum of $5000 is invested at a rate of 1.75% compounded quarterly. How long will it take for you to have $7000?

30. At what rate would you need to invest a given amount of money in order to double your investment in ten years if the interest is compounded continuously?

31. Suppose the water in a hot tub is heated to 150 . After the heater is turned off, the hot tub takes an hour to cool to 120.The temperature of the surrounding air is 80 . Using Newton’s Law of Cooling, find the value of k. Then find the amount of time it would take the hot tub to cool to 100 .

32. You have been given $1000 to invest in an account with interest compounded continuously at a rate of 2.15% for five years. Your best friend wants to invest some money for the same amount of time, but his bank is only offering 2.05% interest. How much more will your friend have to initially invest?

33. The wind speed *s* (in miles per hour) near the center of a tornado is related to the distance *d* (in miles) the tornado travels by the equation . On March 18, 1925, a tornado whose wind speed was about 280 miles per hour struck the Midwest. How far did the tornado travel?