Algebra II Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Chapter 8 Test Review Date\_\_\_\_\_\_\_\_\_\_\_\_\_Hour\_\_\_\_\_\_

In 1 & 2, Graph the exponential function.

 1. y = 6(2.6)x



 2. y = 2(0.5)x

3. Without graphing, determine whether the function y = 4(1.7)x represents

 exponential growth or exponential decay. How do you know?

 Growth or Decay (circle one) Explain: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. Without graphing, determine whether the function y = 10($\frac{7}{8}$)x represents

 exponential growth or exponential decay.

Growth or Decay (circle one) Explain: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. An initial population of 910 quail increases at an annual rate of 9%. Write an exponential function to model the quail population.

A) Write a function that models the population \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

B) How many people will there be in 8 years? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 6. The population of a city is decreasing at a rate of 4% per year. There are currently about 200,000 people in the city. ***Show Work***

1. Write a function that models the population. \_\_\_\_\_\_\_\_\_\_\_\_
2. How many people will there be in 20 years? \_\_\_\_\_\_\_\_\_\_\_\_\_

 7. Write an exponential function y = abx for a graph that \_\_\_\_\_\_\_\_\_\_\_\_\_\_

includes (2, 45) and (0, 5).

 8. Write an exponential function y = abx for a graph that \_\_\_\_\_\_\_\_\_\_\_\_\_\_

includes (1, 45) and (0, 5).

 9. Suppose you invest $1000 at an annual interest rate of 7.8% compounded continuously. How much will you have in the account after 10 years?

 ***Show Work***

 9) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 10. Suppose you invest $900 at an annual interest rate of 5.5% compounded continuously. How much will you have in the account after 30 years?

 ***Show Work***

 10) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 11. The half-life of a certain radioactive material is 63 hours. An initial amount of the material has a mass of 378 kg. Write an exponential function that models the decay of this material. Find how much radioactive material remains after 11 hours. Round your answer to the nearest thousandth. ***Show Work***

11) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 12. The half-life of a certain radioactive material is 39 days. An initial amount of the material has a mass of 975 kg. Write an exponential function that models the decay of this material. Find how much radioactive material remains after 6 days. Round your answer to the nearest thousandth. ***Show Work***

12) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**In 12 & 13, Write the equation in logarithmic form.**

13. 213 = 8,192 13)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

14. $125^{\frac{3}{4}}$= 625 14) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

15. Write the equation log328 = $\frac{3}{5}$ in exponential form. 15) \_\_\_\_\_\_\_\_\_\_\_\_\_\_

16. Write the equation log 1000 = 3 16) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**In 15 - 17, Write each logarithm in exponential form, then evaluate the logarithm.**

 17. log636 17)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 x = \_\_\_\_\_\_\_\_\_\_\_

 18. log3729 18) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 x = \_\_\_\_\_\_\_\_\_\_\_\_\_

 19.  19) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 x = \_\_\_\_\_\_\_\_\_\_\_\_\_



**In Problem 20, Graph the logarithmic equation.**

 20. y = log2x

**In 21 & 22, Write the expression as a single logarithm.**

 21. 3logbw + 6logbx 21) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 22. log980 – log910 22) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**In 23 & 24, Expand the logarithmic expression.**

 23. log9$\frac{m}{6}$ 23) **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

 24. log86c5 24)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 25. Solve 96x = 87. Round to the nearest ten-thousandth. 25)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 ***Show Work***

 26. Solve 165x = 51 . Round to the nearest ten-thousandth. 26) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 ***Show Work***

 27. Solve 1259x – 2 = 150. ***Show work*** 27)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 28. Solve log(9x + 2) = 3. ***Show Work*** 28)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 29. Solve log(5x+8) = 2 ***Show Work*** 29) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 30. Solve 3log2x = 4. Round to the nearest ten-thousandth. 30) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 ***Show Work***

 31. Solve log5x + log7 . Round to the nearest hundredth if necessary. 31) \_\_\_\_\_\_\_\_\_\_\_\_

 ***Show Work***

**In 32 & 33, Write the expression as a single natural logarithm.**

 32. 2ln5 + 4lnb 32) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 33. 3lny – 6lnb 33) \_\_\_\_\_\_\_\_\_\_\_\_

 34. Solve ln x = 0.2 **Show Work** 34) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 36. Solve . Round to the nearest thousandth. **36.** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

***Show Work***

 37. Solve . Round to the nearest thousandth. **37.** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

***Show Work***

**In 33, Use natural logarithms to solve the equation. Round to the nearest thousandth.**

 38.  ***Show Work*** **38.** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 39. The amount of money in an account with continuously compounded interest is given by the formula , where *P* is the principal, *r* is the annual interest rate, and *t* is the time in years. Calculate to the nearest hundredth of a year how long it takes for an amount of money to double if interest is compounded continuously at 2.7%. Round to the nearest tenth.

***Show Work***

  **39.** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 **Algebra II Chapter 8 Review**

**Answer Section**

 1. ****

 2. ****

 3. exponential growth

 4. exponential decay

 5. 

 6. 

 7. 

 8. 

 9. $5080.44

 10. $2,181.47

 11. $4,686.28

 12. ; 334.912 kg

 13. ; 876.380 kg

 14. 

 15. 

 16. 

 17. 2

 18. 6

 19. –2

 20. ****

 21. 

 22. 

 23. 

 24. 

 25. 0.3388

 26. 0.2836

 27. 0.3375

 28. 2.196

 29. 

 30. 

 31. 10.7722

 32. 

 33. 

 34. 

 35. 1.2214

 36. 367.878

 37. 36.103

 38. 0.168

 39. 26 yr

 40. 2.76 decibels