## Algebra II - Chapter 8 Exam Review <br> Please do all work on separate paper. REVIEWS REQUIRED FOR RETEST ELIGIBILITY. NO LATE REVIEWS ACCEPTED

1. The table shows the number of rabbits in a particular meadow $t$ years after a forest fire.

Write an exponential function to model the situation $\left(y=a b^{x}\right) \quad(p 440$, ex. 3$)$
Number of Rabbits

| Years | Rabbits |
| :---: | :---: |
| 0 | 50 |
| 1 | 100 |
| 2 | 200 |
| 3 | 400 |
| 4 | 800 |
| 5 | 1600 |

2. Find the annual percent (r) increase or decrease that $y=0.43(1.5)^{x}$ models. (p 439, ex 2)
Expand the logarithmic expression. (p463 ex 3,)
3. $\log _{9} 10 q^{5}$
4. $\log _{5} \frac{c}{10}$
5. Simplify $\ln e^{7}$.

Write the equation in logarithmic form. (p455, ex 2)
6. $\quad 73=343$
7. $216^{\frac{4}{3}}=1296$
8. A polynomial equation with rational coefficients has the roots $2+\sqrt{7}$ and $4+6 i$. Find two additional roots.(p 344 ex5)
9. Write the equation $\log _{3} 243=5$ in exponential form. (p455, ex 2)
Evaluate the logarithm. (p455, ex32)
10. $\quad \log 0.0001$
11. $\log _{2} \frac{1}{32}$
Factor the expression. (p334, ex 3)
12. $c^{3}-216$
13. The exponential decay graph shows the expected depreciation for a new motorcycle, selling for $\$ 9000$, over 10 years. (p440, ex3)

a. Write an exponential function for the graph.
b. Use the function in part a to find the value of the motorcycle after 5.5 years.

Graph the exponential function. Show a table of values. $(p 438$, ex 4) $14 . \quad y=5 x$
Graph the logarithmic equation. $\left(P 456\right.$, ex5) $\quad$ 15. $y=\log _{5} x \quad$ 16. $\quad y=\log (x+1)+3$

Graph the following equations ( $\mathrm{p} 438, \mathrm{ex} 1$ )
17. $y=-5\left(\frac{1}{7}\right)^{x}$.
18. $y=4(6)^{x+2}+1$.
19. An initial population of 550 quail increases at an annual rate of $22 \%$. Write an exponential function to model the quail population.(P439, ex 2)
20. Write an exponential function $y=a b^{x}$ for a graph that includes $(0,5)$ and $(1,10) .(P 440, e x 3)$
21. For an annual rate of change of $-31 \%$, find the corresponding growth or decay factor.(P339, ex2)
22. The half-life of a certain radioactive material is 53 hours. An initial amount of the material has a mass of 87 kg . Write an exponential function that models the decay of this material. Find how much radioactive material remains after 14 hours. Round your answer to the nearest thousandth.( $p 448$, ex3)
23. Suppose you invest $\$ 1000$ at an annual interest rate of $5.9 \%$ compounded continuously. How much will you have in the account after 25 years?( $p 450$, ex5)

The $\mathbf{p H}$ of a liquid is a measure of how acidic or basic it is. The concentration of hydrogen ions in a liquid is labeled $\left[\mathrm{H}^{+}\right]$. Use the formula $\mathrm{pH}=-\log \left[\mathrm{H}^{+}\right]$to answer questions about $\mathbf{p H} .(P 456$, ex4)
24. Find the pH level, to the nearest tenth, of a liquid with $\left[\mathrm{H}^{+}\right]$about $7.8 \times 10^{-5}$.
25. The pH of a juice drink is 3.5 . Find the concentration of hydrogen ions in the drink.

Write the expression as a single logarithm. ( 4778 , exl)
26. $7 \log _{3} t+4 \log _{3} q$ 27. $\log _{10} 36-\log _{10} 4$
28. Solve $4^{8 x}=118$. Round to the nearest ten-thousandth. . $p 469$, ex14)
29. Use the Change of Base Formula to evaluate $\log _{2} 66$. ( $p 478$, exl4)

Write the expression as a single natural logarithm. $30 . \quad 2 \ln 4+6 \ln y$
31. The sales of televisions $r$ years after a particular model is introduced is given by the function $y=$ $5500 \ln (9 r+4)$, where $y$ is the number of TVs sold. How many TVs will be sold 3.5 years after a model is introduced? Round the answer to the nearest whole number.

Solve .(p479, ex 3)
32. $\ln 3+\ln y=4$
33. $\ln x-\ln 8=0$.

Use natural logarithms to solve. Round to the nearest thousandth. . $p 480$, ex 4 )
34. $5 e^{3 x}-8=9$
35. Simplify $\sqrt[3]{48 a^{13} b^{12}}$. Assume that all variables are positive. $(p 381, e x 2)$

Divide and simplify. Assume that all variables are positive. $\quad 36 . \frac{\sqrt[3]{750 x^{23}}}{\sqrt[3]{2 x}}$ (p382, ex4)
Rationalize the denominator of the expression. Assume that all variables are positive. (p 382, ex5)
37. $\frac{\sqrt{6 x^{10} y^{10}}}{\sqrt{7 x^{4} y^{5}}} \quad$ 38. $\frac{\sqrt{3}-\sqrt{6}}{\sqrt{3}+\sqrt{6}}$

Graph the logarithmic equation. . $p 457$, ex6)
39. $y=\log _{2} x-3$
40. Which function matches the graph? (p 421, examples 1 \&2).

a. $y=\sqrt{x+5}+5$
b. $y=\sqrt{x-5}-5$
c. $y=\sqrt{x+5}-5$
d. $y=\sqrt{x-5}+5$

Graph the functions
41. $y=\sqrt{x}+2$
42. $y=\sqrt{x+3}$

Chapter 8 Review

## Answer Section

1. $y=50(2)^{t}$.
2. $50 \%$ increase
3. $\log _{9} 10+5 \log _{9} q$
4. $\log _{5} c-\log _{5} 10$
5. 7
6. $\log _{7} 343=3$
7. $\log _{216} 1296=\frac{4}{3}$
8. $2-\sqrt{7}, 4-6 i$
9. $3^{5}=243$
10. -4
11. -5
12. $(c-6)\left(c^{2}+6 c+36\right)$
13. a. $y=9000(0.75)^{x}$
b. about $\$ 1750$
14. 


15.

16.

17.

18.

19. $f(x)=550(1.22)^{x}$
20. $y=5(2)^{x}$
21. 0.69
22. $y=87\left(\frac{1}{2}\right)^{\frac{1}{53} x} ; 72.444 \mathrm{~kg}$
23. $\$ 4,371.04$
24. 4.1
25. $3.2 \times 10^{-4}$
26. $\log _{b}\left(t^{7} \mathcal{q}^{4}\right)$
27. $\log _{10} 9$
28. 0.4302
29. 6.044;
30. $\ln 16 y^{6}$
31. 19,632 TVs
32. 18.1993
33. 8
34. 0.408
35. $2 a^{4} b 4 \sqrt[3]{6 a}$
36. $5 x^{7} \sqrt[3]{3 x}$
37. $\frac{x^{3} y^{2} \sqrt{42 y}}{7}$
38. $-3+2 \sqrt{2}$
39.

40. B
41.

42.


