## Exponential and Log Equations Review Sheet

Review is due on the day of the test. All work \& answers must be on a separate sheet of paper.

* No calculator problems

A 0\% will be given for reviews with no work and reviews answered on this page!
*1. Evaluate $\log _{7} \frac{1}{49}$.
*2. Evaluate $\log _{3} 81$.
*3. Write the equation $\log _{16} 8=\frac{3}{4}$ in exponential form.
Write the equation in logarithmic form.
*4. $5^{2}=25$
Write the expression as a single logarithm.
*6. $6 \log _{b} t+7 \log _{3} w$
*7. $\log _{3} 4-\log _{3} 2$

Expand the logarithmic expression.
*8. $\log _{5} \frac{a^{2}}{6}$
*10. Write the expression as a single natural logarithm: $2 \ln b-4 \ln c$
*11. Simplify ln $e^{5}$.
Use the properties of logarithms to evaluate each expression.
*12. $\log _{4} 8+\log _{4} 16-\log _{4} 2$

Graph the logarithmic equation.
*14. $y=\log _{4} x$
Find the inverse of each logarithm function.
*16. $y=\log _{3}(x+1)$
*13. $\log _{2} 6+\log _{2} 16-\log _{2} 3$
*15. $y=\log (x-5)+3$
*17. $y=\log _{4}(x-3)$

The pH 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 $\mathbf{p H}$.
18. Find the pH level, to the nearest tenth, of a liquid with $\left[\mathrm{H}^{+}\right]$about $7.7 \times 10^{-13}$.
19. The pH of a juice drink is 2.8 . Find the concentration of hydrogen ions in the drink.
20. Use the Change of Base Formula to evaluate $\log _{2} 71$.

Solve the exponential equation (hint: use a log). Round to the nearest hundredth if necessary.
21. $3^{3 x}=122$
22. $125^{9 x-2}=150$

Solve the log equation (hint: turn into exponential form). Round to the nearest hundredth if necessary.
23. $\log (2 x+6)=2$
24. Solve $\log _{3}(x+1)=4$.

Use natural logarithms to solve the equation. Round to the nearest thousandth.
25. $4 e^{4 x}+11=19$
26. $5 e^{4 x}+2=16$

Solve the natural log equation (hint: turn into exponential form with e). Round to the nearest hundredth if necessary.
27. $\ln (4 x+1)=1$
28. $\ln 5+\ln x=8$
29. A stock bought at an initial price of $\$ 5$ per share is worth $\$ 12$ per share after 7 years. Find the rate of continuously compounded interest in this investment.
30. An investment of $\$ 300$ is now valued at $\$ 635.75$. The interest rate is $4.5 \%$, compounded continuously. About how long has the money been invested?
31. An investment of $\$ 1,750$ earns $5.75 \%$ interest, which is compounded monthly. After approximately how many years will the investment be worth $\$ 5,000$ ?
32. One scientist estimates that the population of snow leapards in the world will decrease by $3 \%$ each year if nothing is done to save them. There are currently around 7,000 snow leapards. If nothing is done to help them, how long will it take the population of polar bears to decrease to 2,000 ?

