Name KEY Period _____ Date _____

Q4-Review B

Evaluate the logarithmic expression without using a calculator.

1. $\log_2 32 = x$

$2^x = 32$

$x = 5$

2. $\log \sqrt[3]{10}$

$\log_{10} 10^{1/3}$

$\frac{1}{3}$

3. $\log_3 1 = x$

$3^x = 1$

$x = 0$

4. $\ln e^{-4}$

-4

5. $\log_2 0 = x$

$2^x = 0$

no solution

6. $\log_3\left(\frac{1}{9}\right)$

$\log_3 3^{-2}$

-2

Solve the equation.

7. $10^x = 3$

$\log 10^x = \log 3$

$x = \log 3$

8. $e^x = 0.75$

$\ln e^x = \ln 0.75$

$x = \ln 0.75$

9. $1.07^x = 5$

$\ln 1.07^x = \ln 5$

$x \ln 1.07 = \ln 5$

$x = \frac{\ln 5}{\ln 1.07}$

10. $\ln x = 3.2$

$e^{\ln x} = e^{3.2}$

$x = e^{3.2}$

11. $\log x = -4$

$10^{\log x} = 10^{-4}$

$x = 10^{-4}$

12. $2^{x-3} = 5$

$\log 2^{x-3} = \log 5$

$(x-3)\log 2 = \log 5$

$x - 3 = \frac{\log 5}{\log 2}$

$x = \frac{\log 5}{\log 2} + 3$

13. $2\log_3 x + 1 = 5$

$2\log_3 x = 4$

$\log_3 x = 2$

$3^{\log_3 x} = 3^2$

$x = 3^2$

$x = 9$

14. $\log(x+2) + \log(x-1) = 1$

$\log((x+2)(x-1)) = 1$

$10^{\log(x^2+x-2)} = 10^1$

$x^2 + x - 2 = 10$

$x^2 + x - 12 = 0$

$(x+4)(x-3)$

$x = -4, 3$

15. $\ln(3x+4) - \ln 2 = 5$

$e^{\ln\left(\frac{3x+4}{2}\right)} = e^5$

$\frac{3x+4}{2} = e^5$

$3x + 4 = 2e^5$

$x = \frac{2e^5 - 4}{3}$

Use the properties of logarithms to write as a single logarithm.

16. $\log x + \log 5$

$\log 5x$

17. $4\log y - \log z$

$\log y^4 - \log z$

$\log \frac{y^4}{z}$

18. $3\ln(x^3y) + 2\ln(yz^2)$

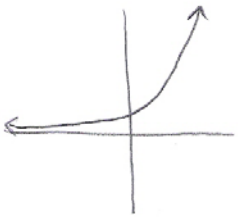
$\ln(x^3y)^3 + \ln(yz^2)^2$

$\ln(x^9y^3 \cdot y^2z^4)$

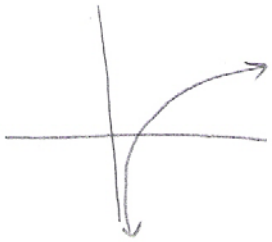
$\ln(x^9y^5z^4)$

Graph each function without using a calculator.

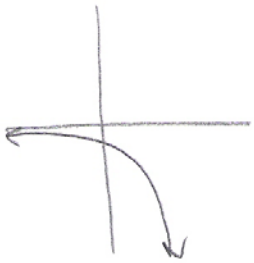
19. $y = e^x$



20. $y = \ln x$



21. $y = -e^x$



22. $y = \ln(x - 4)$