

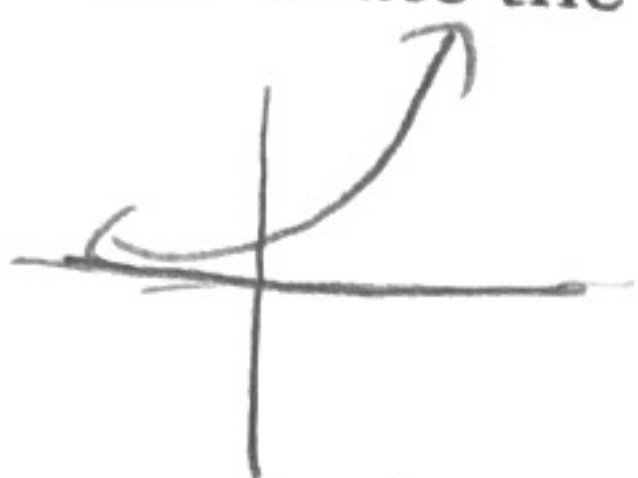
Algebra 2 Trig
Logarithm Review

Name: Key

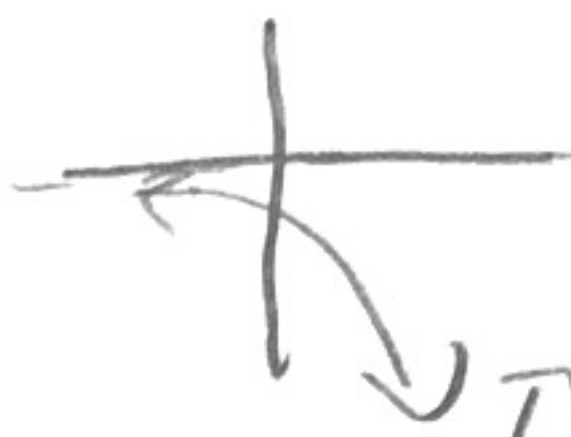
Do all of your work on a separate sheet of paper.

Graph the function. State the domain and range. (Section 7.1)

1. $y = \left(\frac{3}{5}\right)^x$



2. $y = -2 \cdot 2^x$



3. $y = (0.8)^{x-3} - 2$



4. $y = \frac{1}{4} \cdot 3^{x+1} + 2$



Evaluate the logarithm **without** using a calculator. (Section 7.4)

5. $\log_4 \left(\frac{1}{16}\right) = \boxed{x = -2}$

6. $\log_6 6$

$\boxed{x = 1}$

7. $\log_5 125$

$\boxed{x = 3}$

8. $\log_{\frac{3}{4}} \left(\frac{64}{27}\right)$

$\boxed{x = -3}$

Simplify the expression. (Section 7.4)

9. $5^{\log_5 x}$

$\boxed{5}$

10. $10^{\log 9}$

$\boxed{9}$

11. $\log_4 16^x$

$\boxed{2x}$

12. $e^{\ln 5}$

$\boxed{5}$

Expand the expression. (Section 7.5)

13. $\log_5 \left(\frac{2x}{5}\right)$

$\boxed{\log_5 2 + \log_5 x - \log_5 5}$

14. $\log \left(\frac{100x^2}{y}\right)$

$\boxed{\log 100 + 2 \log x - \log y}$

15. $\ln 20x^3y^2$

$\boxed{\ln 20 + 3 \ln x + 2 \ln y}$

16. $\log_2 \sqrt[3]{8x^4}$

$\boxed{\log_2 (8x^4)^{\frac{1}{3}}}$

Condense the expression. (Section 7.5)

17. $\log_4 20 + 4 \log_4 x$

$\boxed{\log_4 20x^4}$

18. $\log 7 + 2 \log x - 5 \log y$

$\boxed{\frac{1}{3} (\log_2 8 + 4 \log_2 x)}$

19. $0.5 \ln 100 - 2 \ln x + 8 \ln y$

$\ln \frac{100^{\frac{1}{2}}}{x^2 y^8} = \boxed{\ln \frac{10}{x^2 y^8}}$

$\boxed{\log \frac{7x^2}{y^5}}$

Use the change of base formula to evaluate the logarithm. (Section 7.5)

20. $\log_2 5$ 2.322

21. $\log_4 80$ 3.161

22. $\log_5 100$ 2.8614

23. $\log_7 27$ 1.6937

Solve the equation. Check for extraneous solutions. (Section 7.6)

24. $2^{4x+2} = 8^{x+2}$
 $2 \quad 2^3$
 $4x+2 = 3x+6$
 $x = 4$

25. $\left(\frac{1}{9}\right)^{x-3} = 3^{3x+1}$
 $3^{-2} = 3$
 $-2x+6 = 3x+1$
 $5 = 5x$ x=1

26. $7^{9x} = 18$ $\log_7 18 = 9x$ x=.165

27. $\ln(3x+7) = \ln(x-1)$ $3x+7 = x-1$ $2x = -8$
x=-4

28. $\log_5(3x+2) = 3$
 $5^3 = 3x+2$ x=41

29. $\log_6(x+9) + \log_6 x = 2$

30. You want to have \$3000 in your savings account after 3 years. Find the amount you should deposit for each of the situations described below.
- a. The account pays 2.25% annual interest compounded quarterly. \$3208.88
 - b. The account pays 3.5% annual interest compounded monthly. \$3331.62
 - c. The account pays 4% annual interest compounded yearly. \$3374.59

31. In 2000, the average price of a football ticket for a Minnesota Vikings game was \$48.28. During the next 4 years, the price increased an average of 6% each year.

- a. Write a model giving the average price p (in dollars) of a ticket t years after 2000. $y = 48.28(1+.06)^t$
- b. Graph the model. Estimate the year when the average ticket price was about \$60. $60 = 48.28(1+.06)^t$
 $1.24 = 1.06^t$
t=4.5

32. You buy a new stereo for \$1300 and are able to sell it 4 years later for \$275. Assume that the resale value of the stereo decays exponentially with time. Write an equation giving the stereo's resale value V (in dollars) as a function of time t (in years) since you bought it.

275 = 1300(1-r)^t

33. You deposit \$2000 in an account that pays 4% annual interest compounded continuously. What is the balance after 5 years?

\$2442.81

34. You deposit \$800 in an account that pays 2.65% annual interest compounded continuously. What is the balance after 12.5 years?

\$1101.70