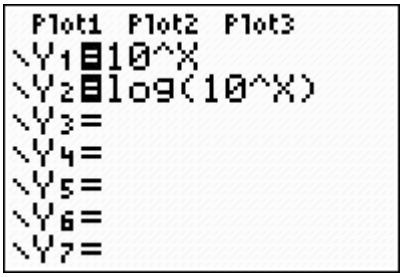
Evaluating Logarithms

Name _____

Class _____

What exactly is the log or logarithm function? To learn about it, press [Y=] and enter the equations $y = 10^x$ and $y = \log(10^x)$.

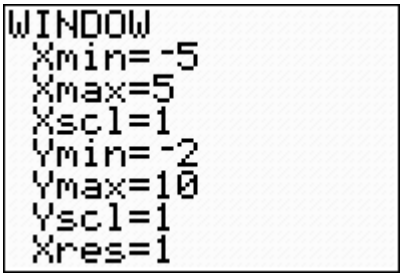


Press [2nd] [TABLE] to view the table.

- What do you notice about the numbers in the three columns?

- What is the value of 10^3? Of log (10^3)?

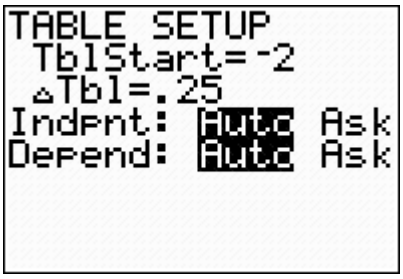
Set the window in order to view the graph. Press [WINDOW]. And adjust the settings as shown.



Press [GRAPH].

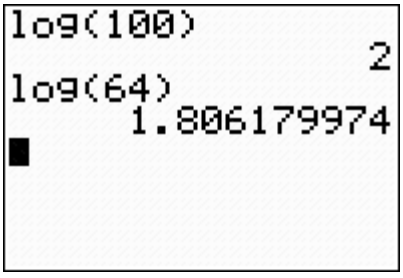
- Why does the graph of $y = \log(10^x)$ appear to be the same as the graph of $y = x$?

Press [2nd] [TBLSET]. Set the table to examine what happens for negative values of x (negative exponents) and for fractional values of x. View the table.



- Do the relationships noticed earlier remain the same? If not, explain how they are different.

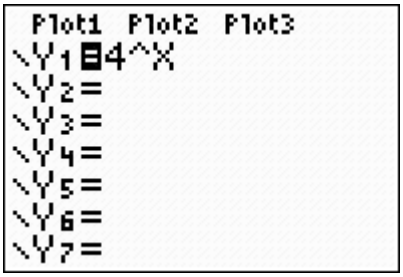
Press [2nd] [QUIT] to return to the Home screen. Use [LOG] to evaluate log(100). Because $10^2 = 100$, the calculation returns a value of 2.



- Try finding the exponent for other values of 10^x such as log(64) as shown. Record your findings.

What happens if the base of your exponential function is not 10? How does that affect the log?

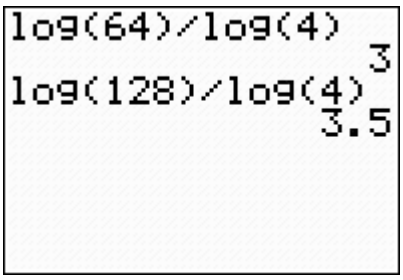
Press [Y=] and clear the previous equations. Enter $y = 4^x$ as shown.



Press [2nd] [TABLE] to view the table.

- What is the value of 4^3? Of 4^4?

Press [2nd] [QUIT] to return to the Home screen. Use [LOG] to evaluate $\log_4 64$. Use the ***change-of-base property*** for logarithms, which says $\log_b a = \frac{\log a}{\log b}$.



- How do these results match the results from the table of values?