

GRAPHING LOGARITHMIC FUNCTIONS

Parent function for logarithmic functions: $y = \log_b x$ where $b > 0$

For the equations below complete the table, sketch the graph, state the domain and range and answer any questions that follow. These can be graphed on your calculator by hitting the (Math) key and then to option (A) from there. These can be used on the home screen, or can be placed into your (y=) to use the table.

1) $y = \log_2 x$

Graph:

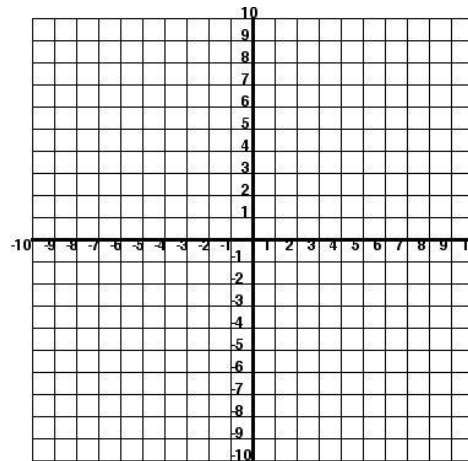


Table:

X	-4	-3	-2	-1	0	1	2	3	4
Y									

Domain and Range:

What is an asymptote? Do you see any asymptotes on this graph?

2) $y = \frac{1}{2} \log_2 x$

Graph:

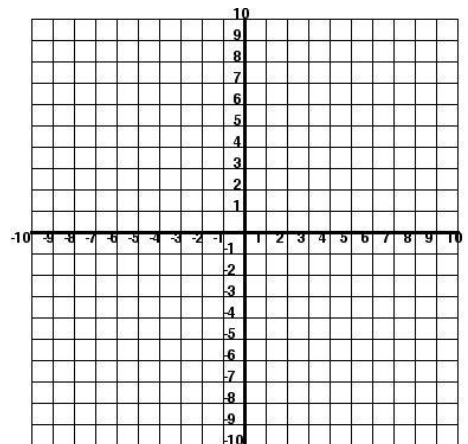


Table:

X									
Y									

Domain and Range:

How does multiplying by a scalar factor of $\frac{1}{2}$ affect the graph compared to $y = \log_2 x$?

What is the asymptote of this graph?

3) $y = 3 \log_2 x$

Graph:

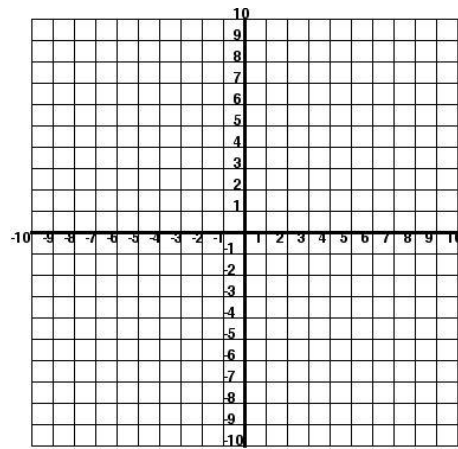


Table:

X									
Y									

Domain and Range:

How does multiplying by a scalar factor of 3 affect the graph compared to $y = \log_2 x$?

What is the asymptote?

4) $y = -\log_2 x$

Graph:

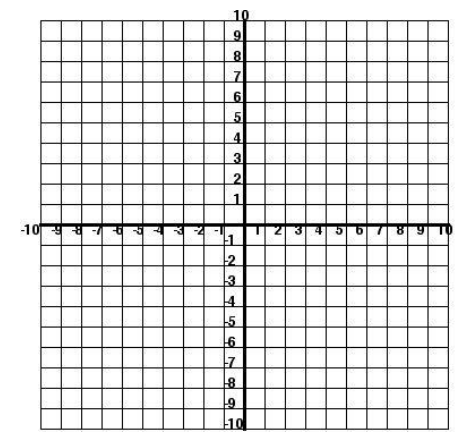


Table:

X									
Y									

Domain and Range:

How does multiplying by a scalar factor of -1 affect the graph compared to $y = \log_2 x$?

What is the asymptote?

5) $y = \log_2(x - 2) + 3$

Graph:

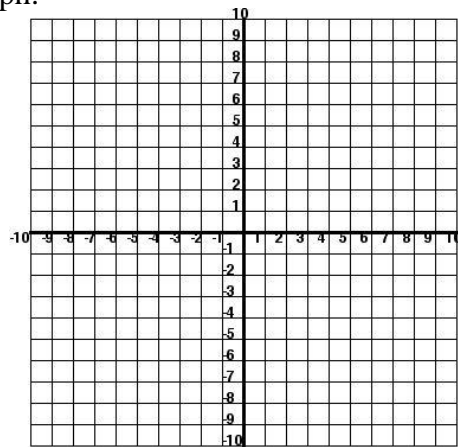


Table:

X									
Y									

Domain and Range:

How do the subtraction of two and the addition of three affect the graph compared to $y = \log_2 x$?

6) $y = \log_{1/2} x$

Graph:

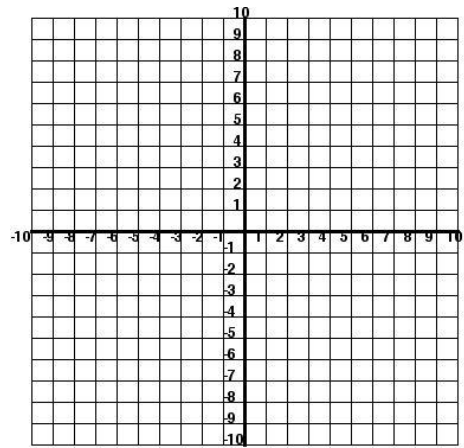


Table:

X	-4	-3	-2	-1	0	1	2	3	4
Y									

Domain and Range:

What happens when the value in the base is a fraction?

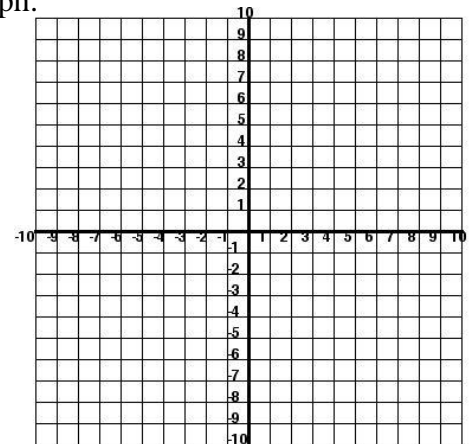
What is the asymptote?

7) Given the form of a logarithmic equation $y = a \log_b(x - h) + k$, explain in your own words what changing the **a**, **b**, **h**, and **k** values will do to the logarithmic function.

8) Tell me everything you can about the equation $y = 2 \log_{0.25}(x + 4) - 6$ without graphing it.

9) $y = -0.5 \log_3(x + 2) - 4$

Graph:

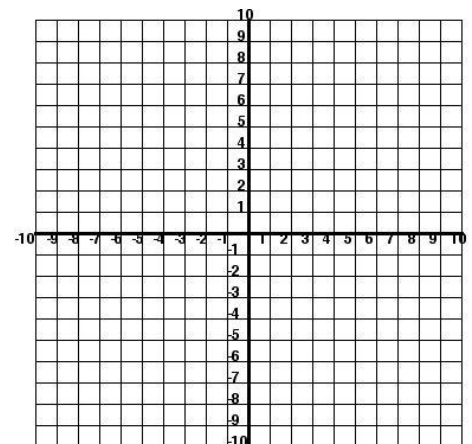


Domain and Range:

What is the asymptote?

10) $y = 3 \log_{3/4}(x - 1) + 5$

Graph:



Domain and Range:

What is the asymptote?

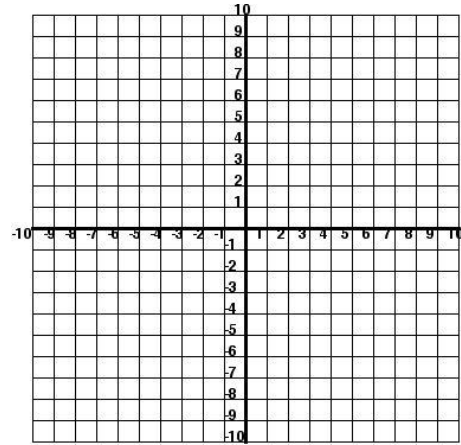
11) In your notes, copy down the key concept box for logarithmic functions located on page 502. Go back to your previous graphs from this packet, and make sure your answers make sense based on this key concept box.

12) $y = \ln x$

Graph:

Table:

X	-4	-3	-2	-1	0	1	2	3	4
Y									



Domain and Range:

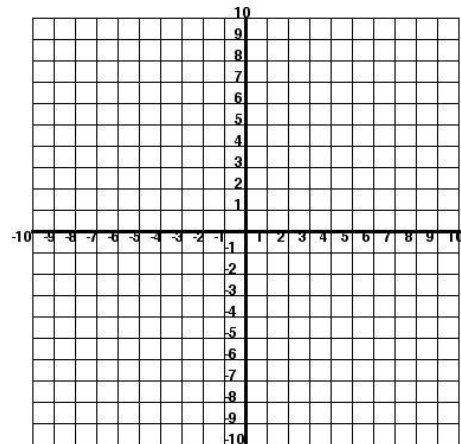
What is the asymptote?

13) $y = -2 \ln x$

Graph:

Table:

X	-4	-3	-2	-1	0	1	2	3	4
Y									



Domain and Range:

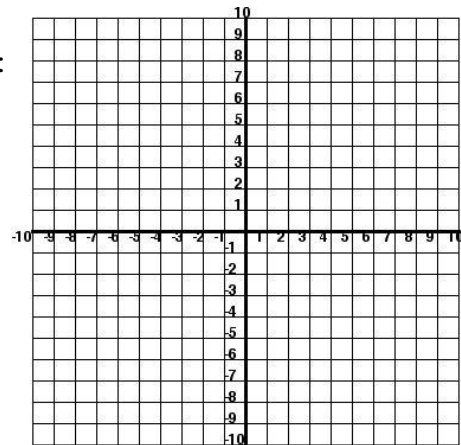
What is the asymptote?

14) $y = \ln(x - 2) + 4$

Graph:

Table:

X	-4	-3	-2	-1	0	1	2	3	4
Y									



Domain and Range:

What is the asymptote?