

5.4 Logarithmic Functions

EXAMPLE: Change $7 = \log_m 5$ into exponential form.

EXAMPLE: Change $\log_c 6 = 8$ into exponential form.

EXAMPLE: Change $q = 1.4^5$ into logarithmic form.

EXAMPLE: Change $2^d = 8$ into logarithmic form.

EXAMPLE: Change $x = e^y$ into logarithmic form.

EXAMPLE: Find the value of $\log 5$ on a calculator and round to the nearest thousandth.

EXAMPLE: Find the value of $\ln 7$ on a calculator and round to the nearest hundredth.

Equal Bases Property

If $a^u = a^v$ then $u = v$.

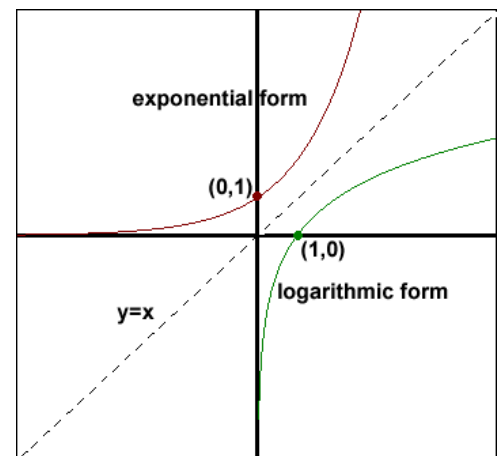
EXAMPLE: Find the exact value of $\log_4 64$.

EXAMPLE: Find the exact value of $\log_{10000} \frac{1}{10000}$.

EXAMPLE: Find the value of $\log 0$ on a calculator and round to the nearest hundredth.

Let's try and draw a graph of $y = \log_b x$. In order to do this, we need to first draw the graph of $x = b^y$.

Key Points: $(1, 0)$ and $(b, 1)$



Domain of $y = \log_b x$ is $x > 0$. Notice that zero is not included since this is a vertical asymptote. Also notice that it doesn't matter what b is.

EXAMPLE: Find the domain of $y = \ln(2x - 7)$ and write your answer in interval notation.

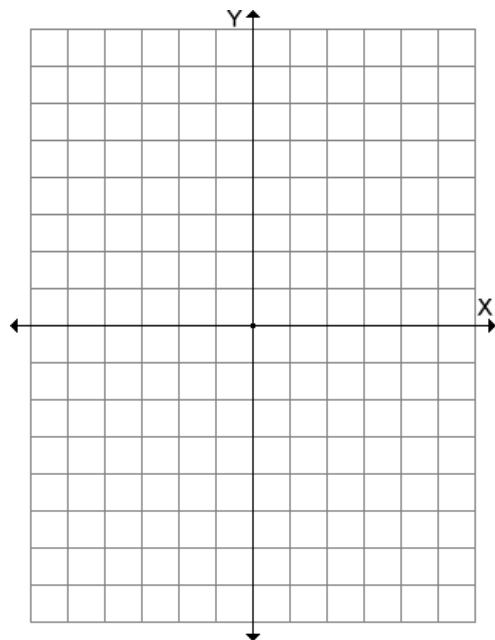
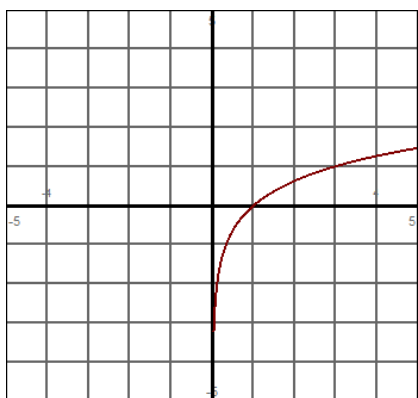
EXAMPLE: Find the domain of $y = \log_3(6 - x)$ and write your answer in interval notation.

EXAMPLE: Find the domain of $y = \log_2\left(\frac{x+2}{2-x}\right)$ and write your answer in interval notation.

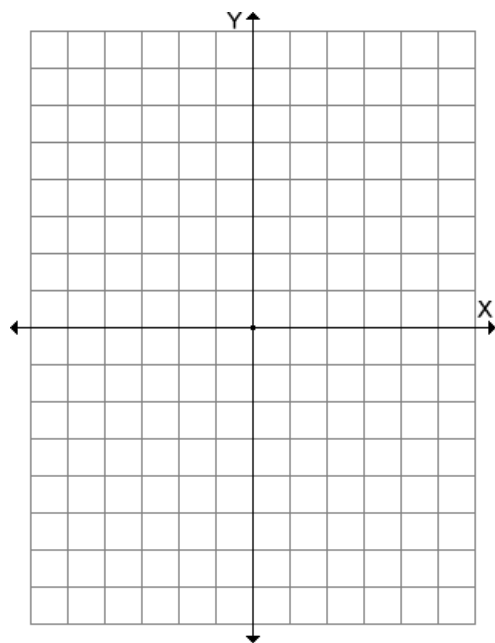
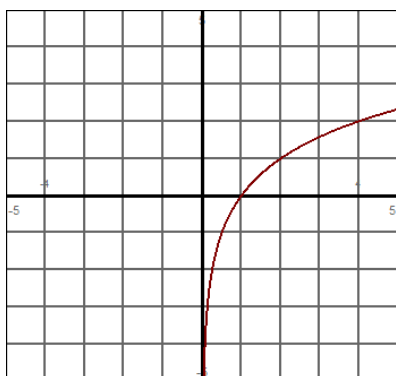
$x + 2$			
$2 - x$			

-2 2

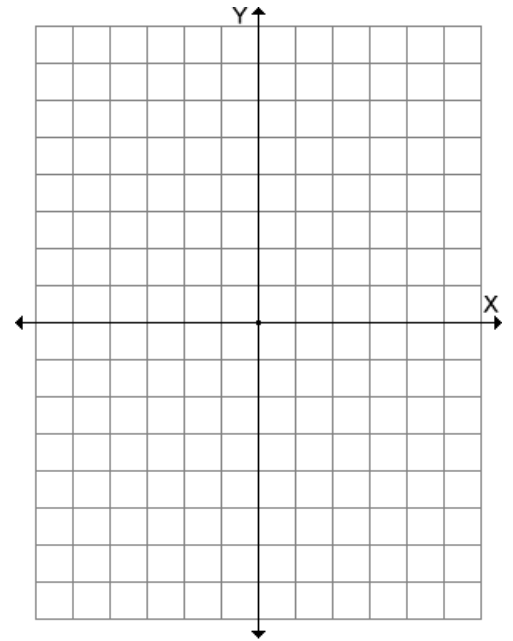
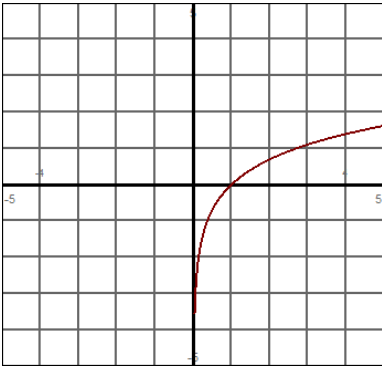
EXAMPLE: Graph using transformations: $y = \log_3(x - 4)$ and identify the x-intercept.



EXAMPLE: Graph using transformations: $y = -\log_2(x + 3)$ and identify the x-intercept.



EXAMPLE: Graph using transformations: $y = \ln(1 - x)$ and identify the x-intercept.



EXAMPLE: Graph using transformations: $y = -\log(-(x + 2))$ and identify the x-intercept.

