

Write your questions  
and thoughts here!

## Exponential Graph Review

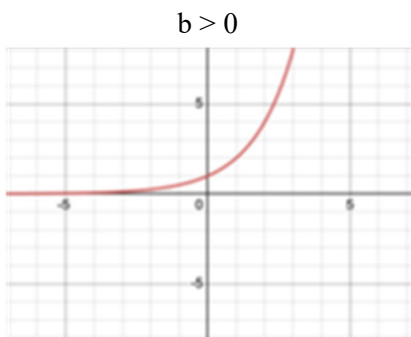
x-intercept:

y-intercept:

asymptote:

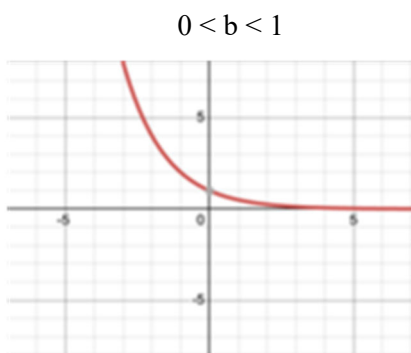
increasing:

decreasing:



domain:

range:



## Logarithmic Graph

x-intercept:

y-intercept:

asymptote:

increasing:

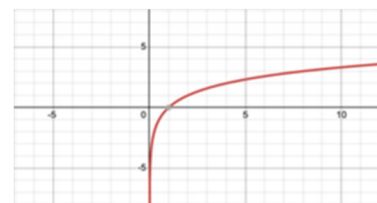
decreasing:

domain:

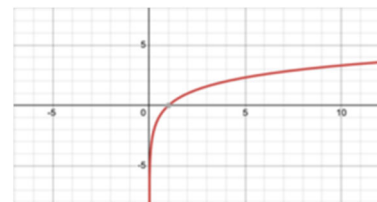
range:

## Transformations of Graphs Review (with Logarithms)

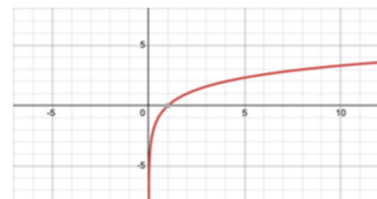
Horizontal/Vertical Translations:



Horizontal/Vertical Dilations



Horizontal/Vertical Reflections



Which transformations affect the domain/range?

Write your questions and thoughts here!

Find the domain/range, asymptotes and end behavior of the following functions.  
(Sketch a graph to help)

a)  $f(x) = \ln(4 - x) + 2$

b)  $f(x) = -2 \cdot \log_3(x - 2)$

USE A CALCULATOR

c)  $f(x) = \log(x - 5)^2$

## 2.11 Logarithmic Functions

AP Precalculus

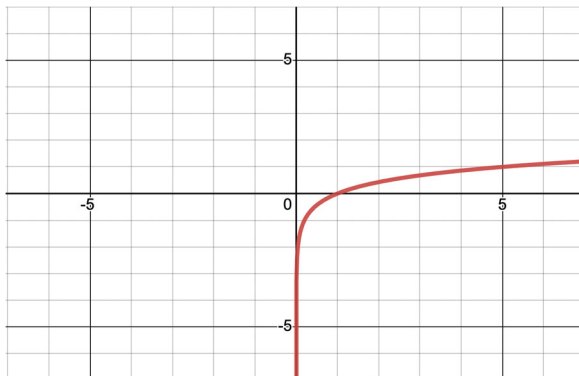
## 2.11 Practice

**Instructions: Sketch a graph of the transformation of  $f(x) = \log_5 x$  onto the graph. Label each graph.**

1)  $f(x) = 3 \log_5(x + 2) - 4$

2)  $f(x) = 3 \log_5(3 - x) + 1$

3)  $f(x) = -\log_5(x - 3) - 2$



**Instructions: Find all relevant information from the given function. Sketch a graph. No calculator.**

4)  $f(x) = \ln(x - 3) + 5$

Asymptote:

Domain:

Range:

End Behavior:

Graph:

5)  $f(x) = -2 \log_2(x + 3) - 6$

Asymptote:

Domain:

Range:

End Behavior:

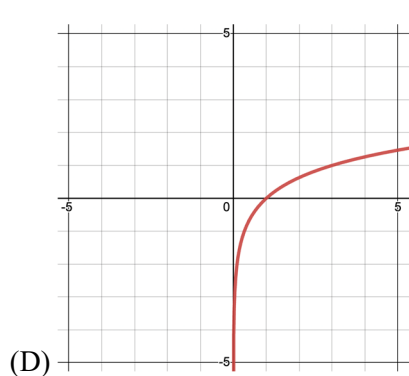
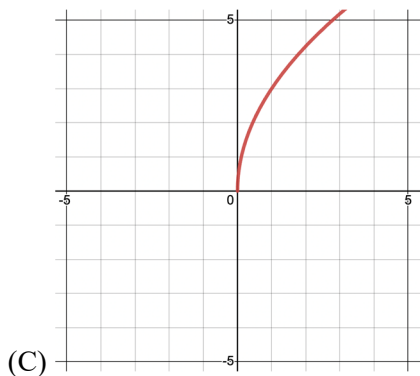
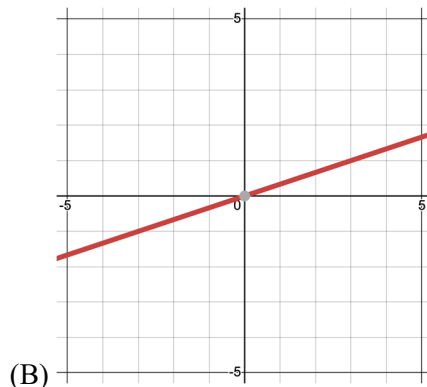
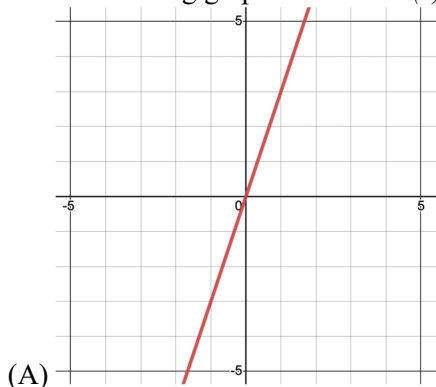
Graph:

<p>6) <math>f(x) = \log_6(8 - x) + 1.5</math></p> <p>Asymptote:</p> <p>Domain: <span style="margin-left: 150px;">Range:</span></p> <p>End Behavior:</p> <p>Graph:</p>	<p>7) <math>f(x) = -\log(2x - 5)</math></p> <p>Asymptote:</p> <p>Domain: <span style="margin-left: 150px;">Range:</span></p> <p>End Behavior:</p> <p>Graph:</p>
<p>8) <math>f(x) = 455 \log_9(x + 376) - 543</math></p> <p>Asymptote:</p> <p>Domain: <span style="margin-left: 150px;">Range:</span></p> <p>End Behavior:</p> <p>Graph:</p>	<p>9) <math>f(x) = -3 \ln(10 - x)</math></p> <p>Asymptote:</p> <p>Domain: <span style="margin-left: 150px;">Range:</span></p> <p>End Behavior:</p> <p>Graph:</p>
<p><b>Instructions: Write a logarithmic function with the given information.</b></p>	
<p>10) End Behavior</p> <p style="text-align: center;"> <math>x \rightarrow \infty, f(x) \rightarrow \infty</math>  <math>x \rightarrow -6^+, f(x) \rightarrow -\infty</math> </p>	<p>11) Domain</p> <p style="text-align: center;"><math>(-\infty, 8)</math></p>
<p><b>CALCULATOR ACTIVE: Instructions: Find all relevant information.</b></p>	
<p>10) <math>f(x) = \log( x + 4 ) - 10</math></p> <p>Asymptote:</p> <p>Domain: <span style="margin-left: 150px;">Range:</span></p> <p>End Behavior:</p>	<p>11) <math>f(x) = -3 \ln\left(\frac{x+7}{x}\right)</math></p> <p>Asymptote:</p> <p>Domain: <span style="margin-left: 150px;">Range:</span></p> <p>End Behavior:</p>

## 2.11 Logarithmic Functions

## 2.11 Test Prep

12) The function  $h$  has the relationship that when the input is tripled the output values will increase by 1. Which of the following graphs could be  $h(x)$ ?



13) Which of the following functions could have the following end behavior?

$$\begin{aligned}x &\rightarrow 10^-, f(x) \rightarrow \infty \\x &\rightarrow -\infty, f(x) \rightarrow -\infty\end{aligned}$$

- (A)  $f(x) = -3 \ln(x - 10) + 5$   
(B)  $g(x) = -2 \log(5 - x) + 10$   
(C)  $h(x) = -\log_3(10 - x) - 5$   
(D)  $j(x) = \log(10 - x) + 4$

14) CALCULATOR ACTIVE: If  $\log_{0.2}(x + 2) < \log_{0.04}(x + 2)$ , then  $x$  lies in which of the following intervals?

- (A)  $(-\infty, -1)$   
(B)  $(-2, -1)$   
(C)  $(-1, \infty)$   
(D)  $(1, 2)$