

Algebra 2 Honors: Graphing Exponential and Logarithmic Functions

I.

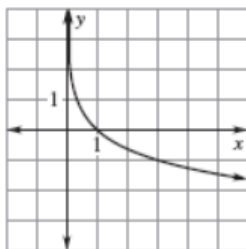
Match the function with its graph.

1. $f(x) = \log_2 x$

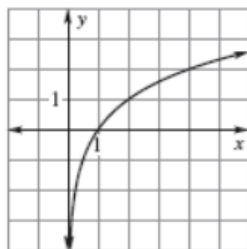
2. $f(x) = \log_5 x$

3. $f(x) = \log_{1/3} x$

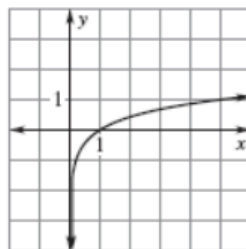
A.



B.



C.



II.

Match each function with its graph.

1. $f(x) = 2^x$

2. $f(x) = -2^x$

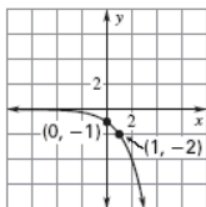
3. $f(x) = 4(2^x)$

4. $f(x) = \frac{1}{2}(2^x)$

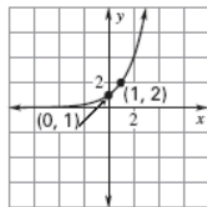
5. $f(x) = -\frac{1}{2}(2^x)$

6. $f(x) = -4(2^x)$

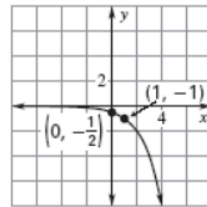
A.



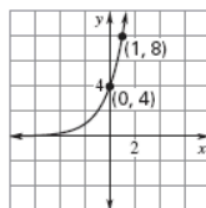
B.



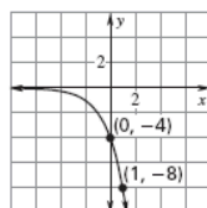
C.



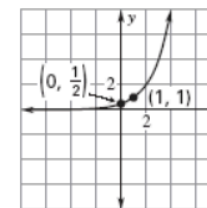
D.



E.



F.



III. Given $f(x) = 4^x$, write the function for the following transformations.

1. $f(x)$ shifts 6 units to the right

2. $f(x)$ shifts down 8 units

3. $f(x)$ stretches vertically by a factor of 2

4. $f(x)$ shifts right 7 units and as $x \rightarrow \infty$, $y \rightarrow -\infty$

IV. Tell whether the function represents exponential growth or decay. Sketch and state the domain and range in set notation.

1. $y = 3 \cdot 2^{x+2}$
2. $y = -\left(\frac{1}{4}\right)^{x-1}$
3. $y = 4 \cdot \left(\frac{1}{2}\right)^x - 3$
4. $y = 3e^x + 1$

V. Sketch each logarithmic function and state the domain and range in set notation.

1. $y = \log(x-2) + 4$
2. $y = \ln x - 5$
3. $y = \log_{1/2} x$

VI. TRUE or FALSE.

$$f(x) = 5(4)^{-x}$$

$$f(x) = 5(0.25)^x$$

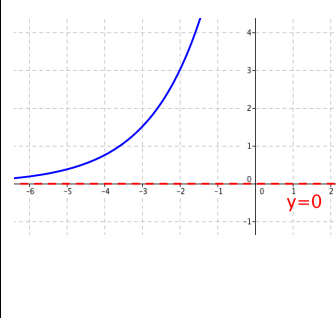
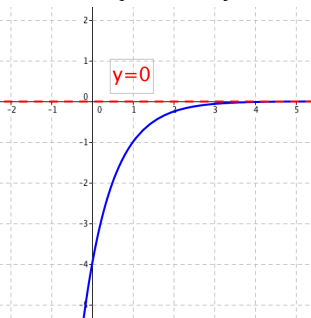
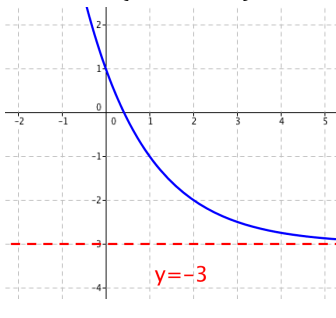
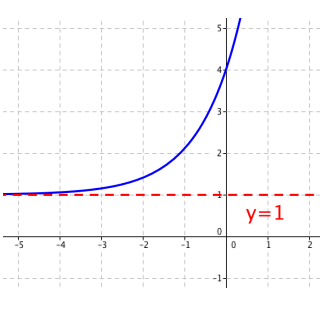
$$h(x) = \left(\frac{1}{2}\right)^{x-2} + 3$$

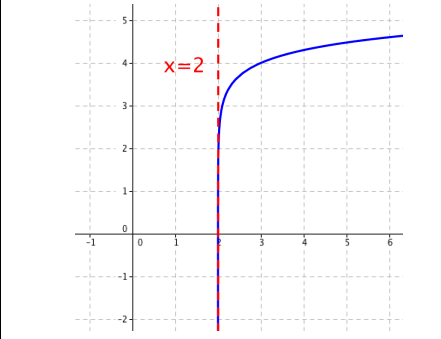
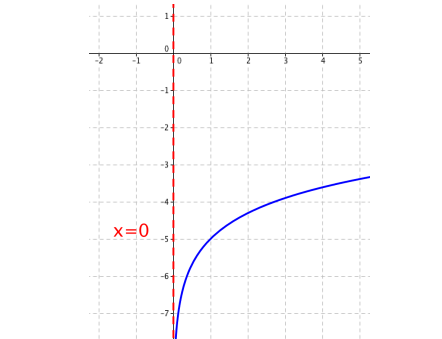
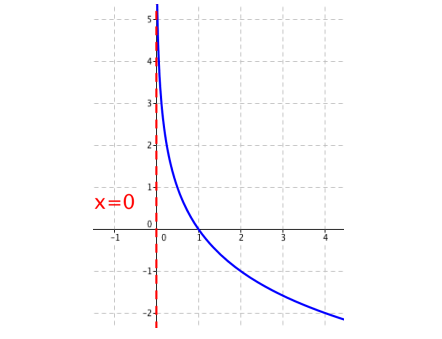
$$r(x) = \log_4 x + 5$$

1. $f(x)$ and $g(x)$ represent the same function.
2. The asymptote for $h(x)$ is $y = 2$
3. The asymptote for $r(x)$ is $x = 5$
4. $f(x)$ is an exponential decay function.

ANSWERS

<p>I.</p> <ol style="list-style-type: none"> 1. B 2. C 3. A 	<p>II.</p> <ol style="list-style-type: none"> 1. B 2. A 3. D 4. F 5. C 6. E 	<p>III.</p> <ol style="list-style-type: none"> 1. $y = 4^{x-6}$ 2. $y = 4^x - 8$ 3. $y = 2 \cdot 4^x$ 4. $y = -4^{x-7}$
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<p>IV.</p>			
<p>1. Exp. Growth Domain: $\{x \mid x \in \mathbb{R}\}$ Range: $\{y \mid y > 0\}$</p> 	<p>2. Exp. Decay Domain: $\{x \mid x \in \mathbb{R}\}$ Range: $\{y \mid y < 0\}$</p> 	<p>3. Exp. Decay Domain: $\{x \mid x \in \mathbb{R}\}$ Range: $\{y \mid y > -3\}$</p> 	<p>4. Exp. Growth Domain: $\{x \mid x \in \mathbb{R}\}$ Range: $\{y \mid y > 1\}$</p> 

<p>V.</p>		
<p>1. Domain: $\{x \mid x > 2\}$ Range: $\{y \mid y \in \mathbb{R}\}$</p> 	<p>2. Domain: $\{x \mid x > 0\}$ Range: $\{y \mid y \in \mathbb{R}\}$</p> 	<p>3. Domain: $\{x \mid x > 0\}$ Range: $\{y \mid y \in \mathbb{R}\}$</p> 

<p>VI.</p> <ol style="list-style-type: none"> 1. TRUE 2. FALSE 3. FALSE 4. TRUE
