Directions: Write limit statements for the end behavior of the following logarithmic functions.

1. $f(x) = 3\log_2 x$

Left: _____

Right: _____

2. $g(x) = -2\log x$

Left: _____

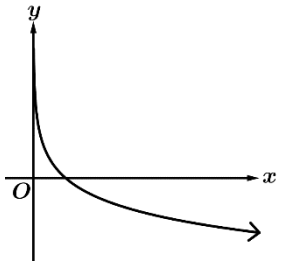
Right: _____

3. $h(x) = \frac{3}{4}\log_\pi x$

Left: _____

Right: _____

Directions: The graphs of k and m are shown below. Use the graphs to answer the following.



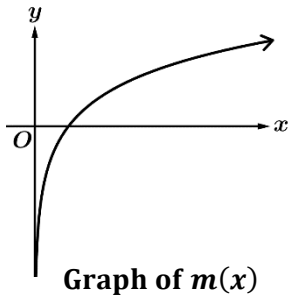
Graph of $k(x)$

4. The graph of k is
(A) increasing at an increasing rate.
(B) increasing at a decreasing rate.
(C) decreasing at an increasing rate.
(D) decreasing at a decreasing rate.

5. Which of the following pairs of limit statements correctly describes the end behavior of k?
(A) $\lim_{x\to 0^+} k(x) = -\infty$ and $\lim_{x\to\infty} k(x) = -\infty$
(B) $\lim_{x\to 0^+} k(x) = -\infty$ and $\lim_{x\to\infty} k(x) = \infty$
(C) $\lim_{x\to 0^+} k(x) = \infty$ and $\lim_{x\to\infty} k(x) = -\infty$
(D) $\lim_{x\to 0^+} k(x) = \infty$ and $\lim_{x\to\infty} k(x) = \infty$

6. Which of the following could be the equation for k?
(A) $k(x) = -2\log_4 x$ (B) $k(x) = 2\log_4 x$
(C) $k(x) = -4(2)^x$ (D) $k(x) = 4\left(\frac{1}{2}\right)^x$

7. Which of the following equations could be k^{-1}?
(A) $k^{-1}(x) = \left(\frac{1}{2}\right)^x$ (B) $k^{-1}(x) = -(2)^x$
(C) $k^{-1}(x) = \frac{-1}{2\log_4 x}$ (D) $k^{-1}(x) = -2\log_4 x$



Graph of $m(x)$

8. The graph of m is
(A) increasing at an increasing rate.
(B) increasing at a decreasing rate.
(C) decreasing at an increasing rate.
(D) decreasing at a decreasing rate.

9. Which of the following pairs of limit statements correctly describes the end behavior of m?
(A) $\lim_{x\to 0^+} m(x) = -\infty$ and $\lim_{x\to\infty} m(x) = -\infty$
(B) $\lim_{x\to 0^+} m(x) = -\infty$ and $\lim_{x\to\infty} m(x) = \infty$
(C) $\lim_{x\to 0^+} m(x) = \infty$ and $\lim_{x\to\infty} m(x) = -\infty$
(D) $\lim_{x\to 0^+} m(x) = \infty$ and $\lim_{x\to\infty} m(x) = \infty$

10. Which of the following could be the equation for m?
(A) $m(x) = -3\log_8 x$ (B) $m(x) = 3\log_8 x$
(C) $m(x) = -3(8)^x$ (D) $m(x) = 3(8)^x$

11. Which of the following equations could be m^{-1}?
(A) $m^{-1}(x) = \left(\frac{1}{2}\right)^x$ (B) $m^{-1}(x) = -(2)^x$
(C) $m^{-1}(x) = 2^x$ (D) $m^{-1}(x) = \frac{1}{3\log_8 x}$

Directions: Selected values of the several logarithmic functions are shown in the tables below. For each table, find the value of the constant k.

12.

x	$f(x)$
0.3	2
3	5
30	8
k	11
3000	14

13.

x	$g(x)$
$\frac{3}{4}$	1
3	2
k	3
48	4

14.

x	$h(x)$
$12k$	$k-1$
$6k$	k
$3k$	$k+1$
6	$k+2$
3	$k+3$

15.

x	$l(x)$
3^7	4
3^5	6
27	8
3	10
k	12

16. Let $f(x)=3\log_5(x+4)$.

a) Find the domain and range of the function f.

b) If $g(x)=-2f(x-3)$, find the domain and range of g.

c) If $k(x)=f(2x)+7$, find the domain and range of k.