F.IF.C.7: Graphing Logarithmic Functions 2

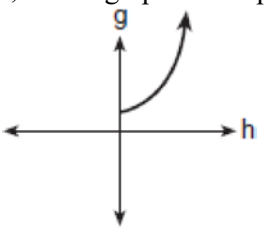
1 For which value of x is $y = \log x$ undefined?

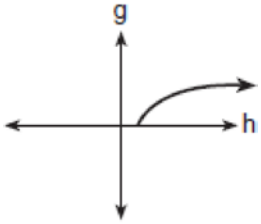
1) 0
2) $\frac{1}{10}$
3) π
4) 1.483

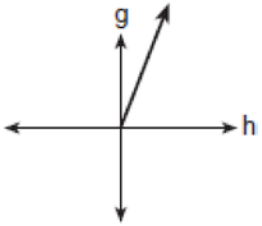
2 The graph of $y = \log x$ lies in Quadrant(s)

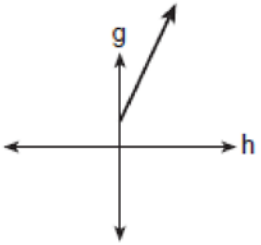
1) I and II
2) II and III
3) III and IV
4) I and IV

3 The cells of a particular organism increase logarithmically. If g represents cell growth and h represents time, in hours, which graph best represents the growth pattern of the cells of this organism?

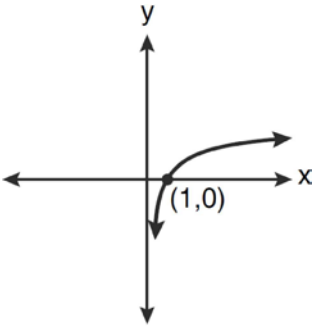
1)


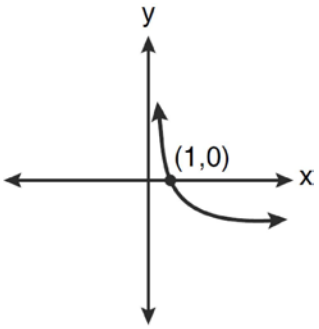
3)


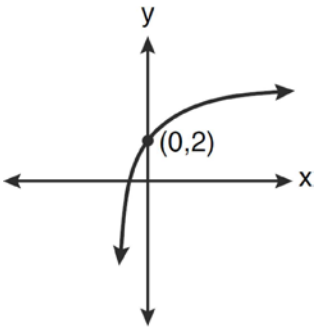
2)


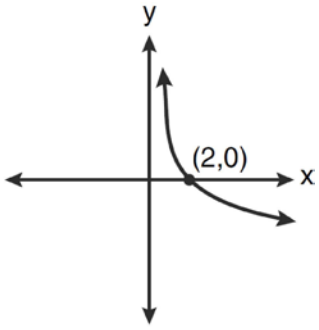
4)


4 Which graph represents the function $\log_2 x = y$?

1)


3)


2)


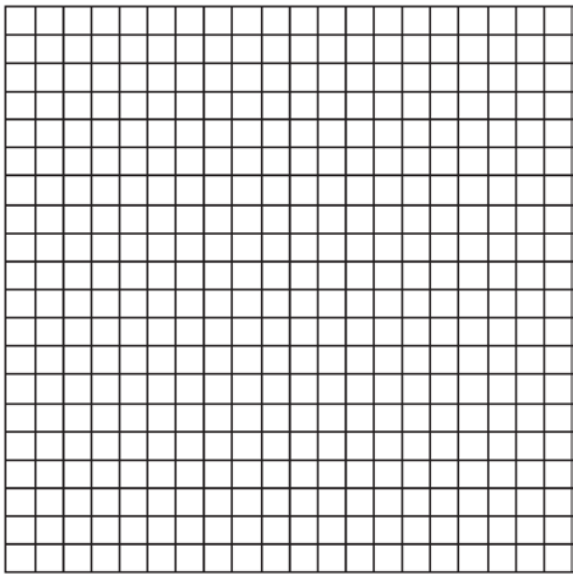
4)


5 For what value of k will the graph of $y = \log_{10} x$ contain the point $(1, k)$?

6 Complete the table below for the values of y for the equation $y = \log_2 x$.

x	$\frac{1}{4}$	$\frac{1}{2}$	1	2	4
y					

7 A hotel finds that its total annual revenue and the number of rooms occupied daily by guests can best be modeled by the function $R = 3\log(n^2 + 10n)$, $n > 0$, where R is the total annual revenue, in millions of dollars, and n is the number of rooms occupied daily by guests. The hotel needs an annual revenue of \$12 million to be profitable. Graph the function on the accompanying grid over the interval $0 < n \leq 100$. Calculate the minimum number of rooms that must be occupied daily to be profitable.



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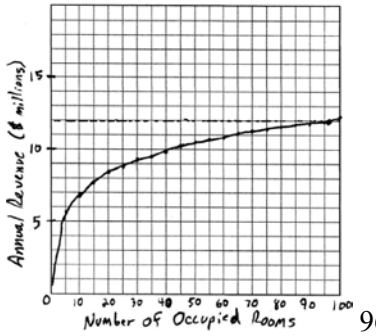
Answer Section

1 ANS: 1 REF: 060301b
2 ANS: 4 REF: 018535siii
3 ANS: 3 REF: 010420b
4 ANS: 1 REF: 061211a2
5 ANS:
0

REF: 088508siii
6 ANS:

x	$\frac{1}{4}$	$\frac{1}{2}$	1	2	4
y	-2	-1	0	1	2

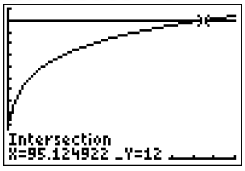
REF: 019742siii
7 ANS:



96

$$3\log(n^2+10n)=12$$
$$\log(n^2+10n)=4$$
$$n^2+10n=10^4$$
$$n^2+10n-10000=0$$

$$x=\frac{-10\pm\sqrt{10^2-4(-10000)}}{2}$$
$$x=\frac{-10+\sqrt{40100}}{2}\approx 95.1$$



. 96 rooms must be occupied. The other root is negative.

REF: 080530b