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

1 For which value of x is $y = \log x$ undefined?
1) 0
2) $\dfrac{1}{10}$
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

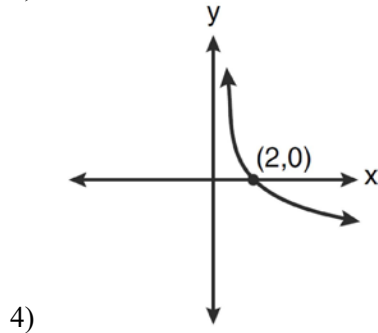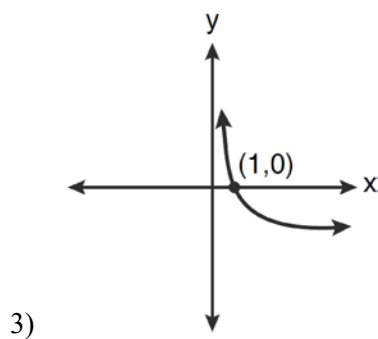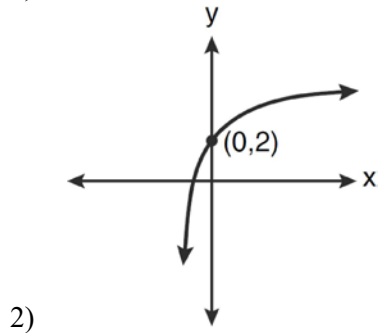3 In which function is the range equal to the domain?
1) $y = 2^x$
2) $y = x^2$
3) $y = \log x$
4) $y = x$

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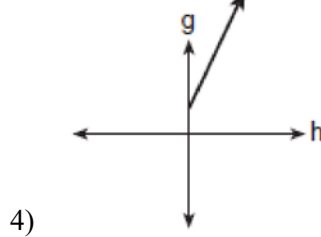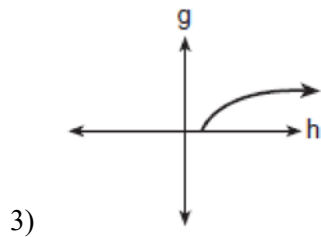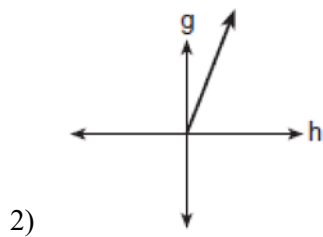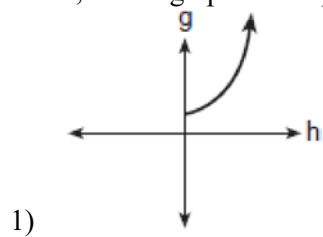
5 Which graph represents the function $\log_2 x = y$?

1)

3)

2)

4)
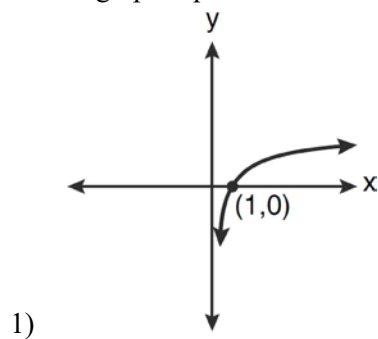
6 For what value of k will the graph of $y = \log_{10} x$ contain the point $(1, k)$?

7 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					

8   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 $0 < n \le 100$. Calculate the minimum number of rooms that must be occupied daily to be profitable.
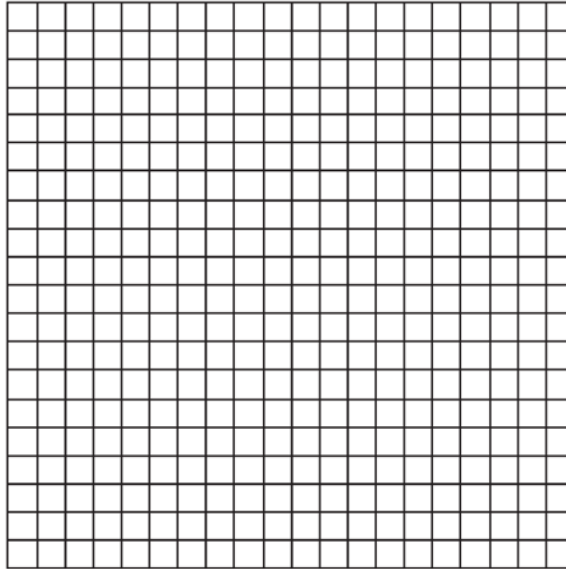
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Answer Section

1 ANS: 1   REF: 060301b
2 ANS: 4   REF: 018535siii
3 ANS: 4   REF: 088716siii
4 ANS: 3   REF: 010420b
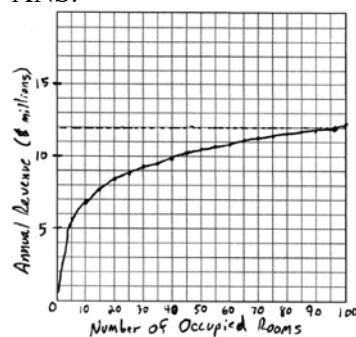5 ANS: 1   REF: 061211a2
6 ANS:
   0

   REF: 088508siii
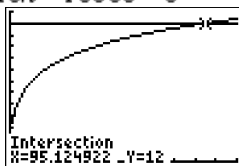7 ANS:

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

   REF: 019742siii
8 ANS:

$3\log(n^2 + 10n) = 12$

$\log(n^2 + 10n) = 4$

$n^2 + 10n = 10^4$

$n^2 + 10n - 10000 = 0$

$x = \dfrac{-10 \pm \sqrt{10^2 - 4(-10000)}}{2}$

$x = \dfrac{-10 + \sqrt{40100}}{2} \approx 95.1$

. 96 rooms must be

occupied. The other root is negative.

   REF: 080530b