F.IF.C.7: Graphing Logarithmic Functions 1

1 The asymptote of the graph of $f(x) = 5\log(x+4)$ is
   1) $y = 6$ 3) $x = 4$
   2) $x = -4$ 4) $y = 5$

2 Which statement about the graph of $c(x) = \log_6 x$ is *false*?
   1) The asymptote has equation $y = 0$.   3) The domain is the set of positive reals.
   2) The graph has no y-intercept.   4) The range is the set of all real numbers.

3 Which statement below about the graph of $f(x) = -\log(x+4)+2$ is true?
   1) $f(x)$ has a y-intercept at $(0,2)$.   3) As $x \to \infty, f(x) \to \infty$.
   2) $-f(x)$ has a y-intercept at $(0,2)$.   4) $x \to -4, f(x) \to \infty$.

4 If $f(x) = \log_3 x$ and $g(x)$ is the image of $f(x)$ after a translation five units to the left, which equation represents $g(x)$?
   1) $g(x) = \log_3(x+5)$ 3) $g(x) = \log_3(x-5)$
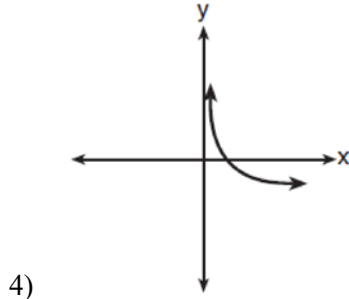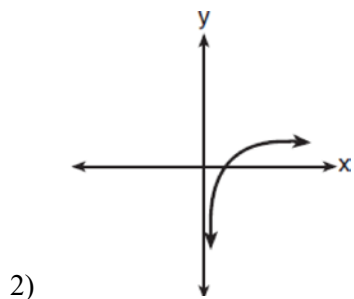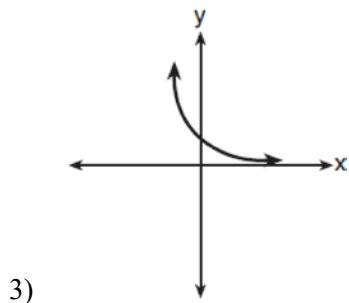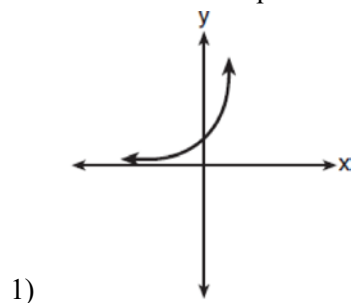   2) $g(x) = \log_3 x + 5$ 4) $g(x) = \log_3 x - 5$

5 The graph of $y = \log_2 x$ is translated to the right 1 unit and down 1 unit. The coordinates of the x-intercept of the translated graph are
   1) $(0,0)$ 3) $(2,0)$
   2) $(1,0)$ 4) $(3,0)$
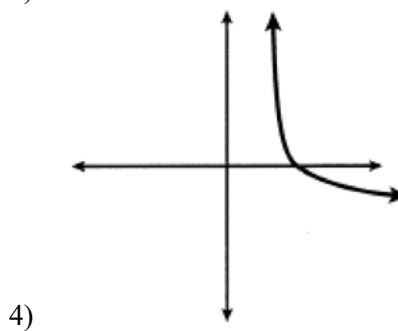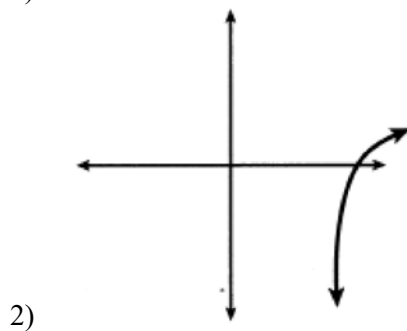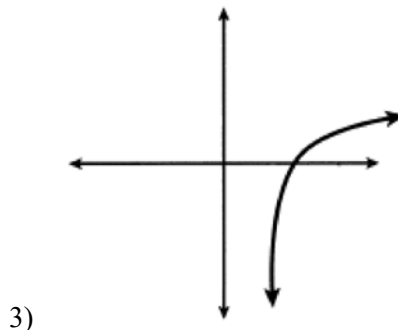
6 Which equation best represents the graph below?
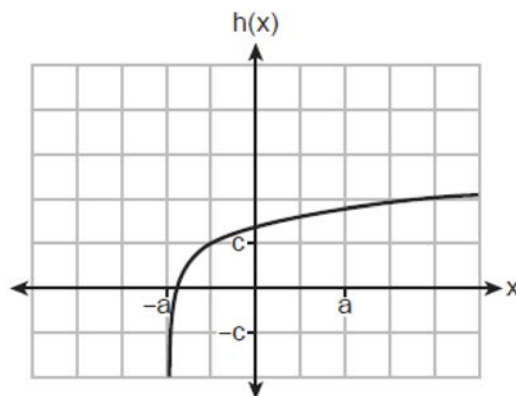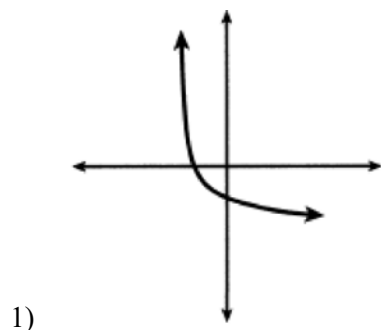

   1) $h(x) = \log(x+a)+c$ 3) $h(x) = \log(x+a)-c$
   2) $h(x) = \log(x-a)+c$ 4) $h(x) = \log(x-a)-c$

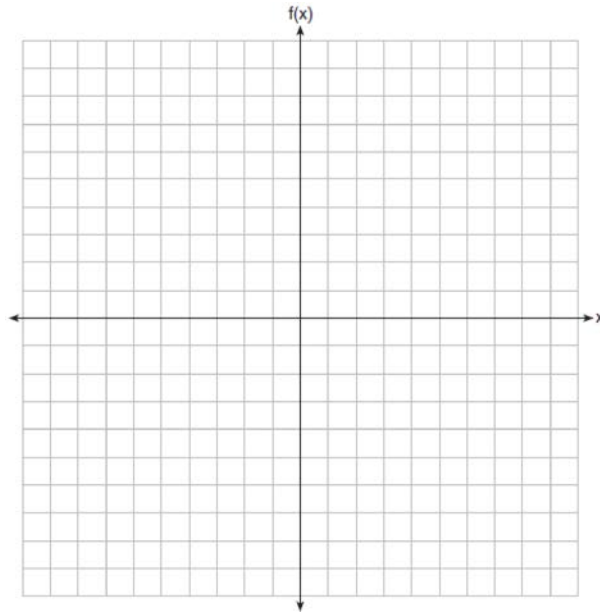7 Which sketch best represents the graph of $x = 3^y$?

1)

3)

2)

4)

8 Which sketch could represent the function $m(x) = -\log_{100}(x - 2)$?
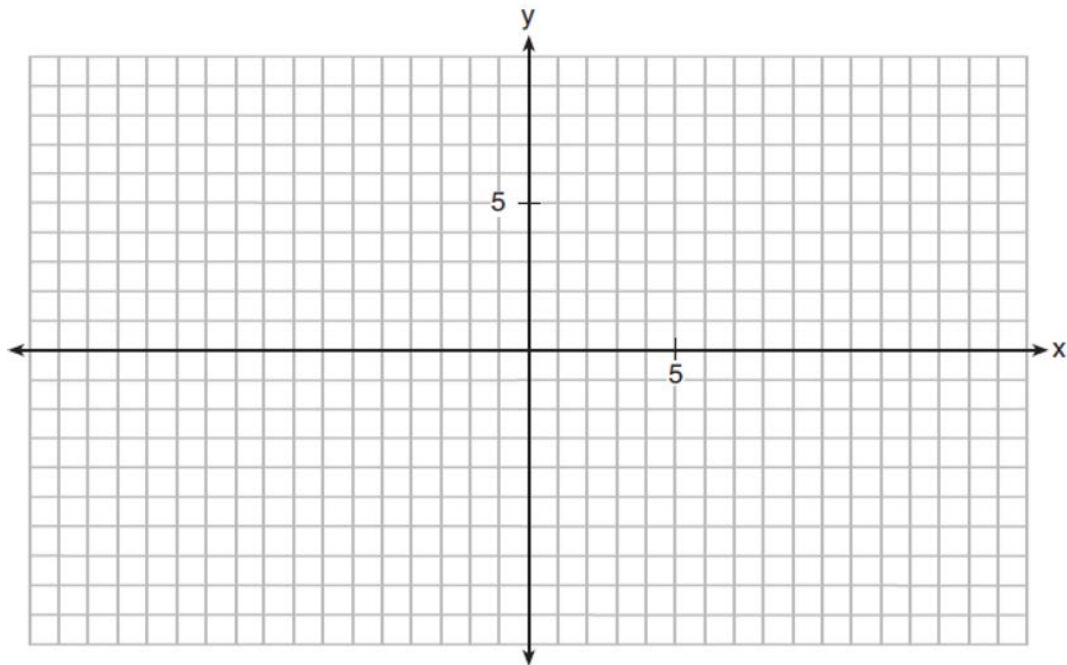
1)

3)

2)

4)

9 Describe the translations that map $f(x) = \log x$ to $g(x) = \log(x + 3) - 5$.
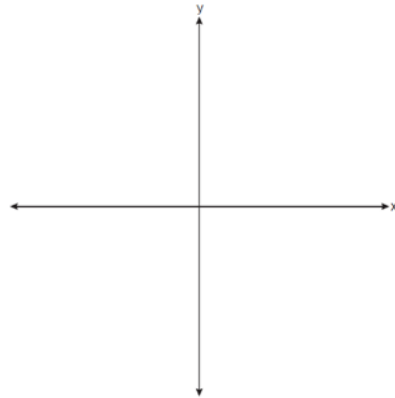
10   Graph $f(x) = \log_2 (x + 6)$ on the set of axes below.

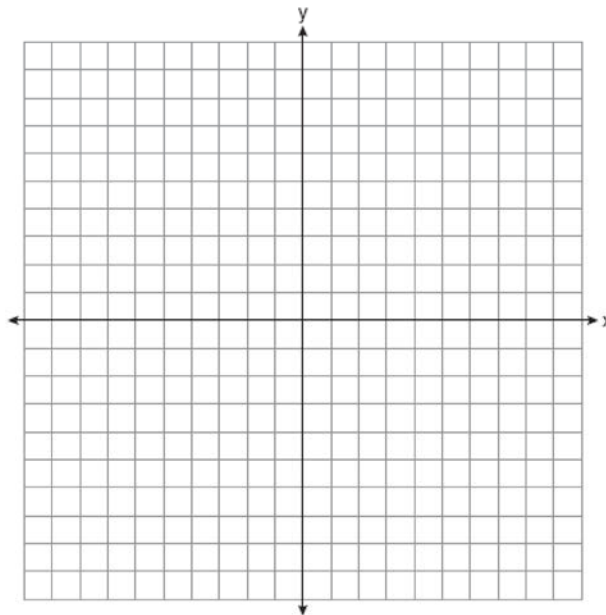11   On the grid below, graph the function $y = \log_2 (x - 3) + 1$
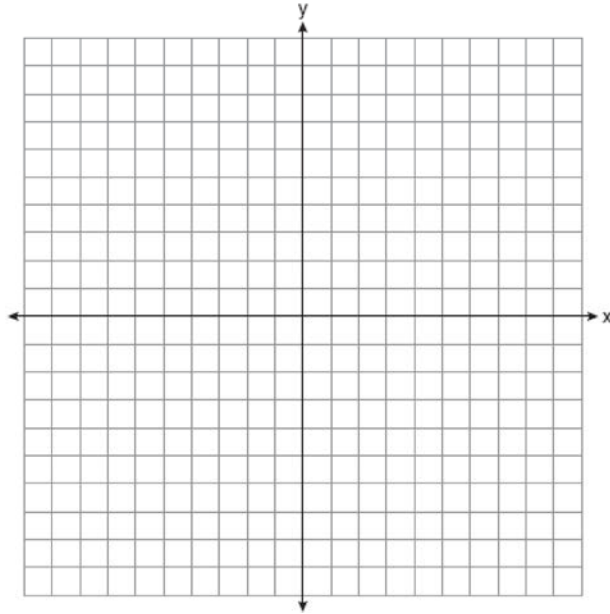
12 Sketch $p(x) = -\log_2(x+3) + 2$ on the axes below.

Describe the end behavior of $p(x)$ as $x \to -3$. Describe the end behavior of $p(x)$ as $x \to \infty$

13 Graph $y = \log_2(x+3) - 5$ on the set of axes below. Use an appropriate scale to include *both* intercepts.

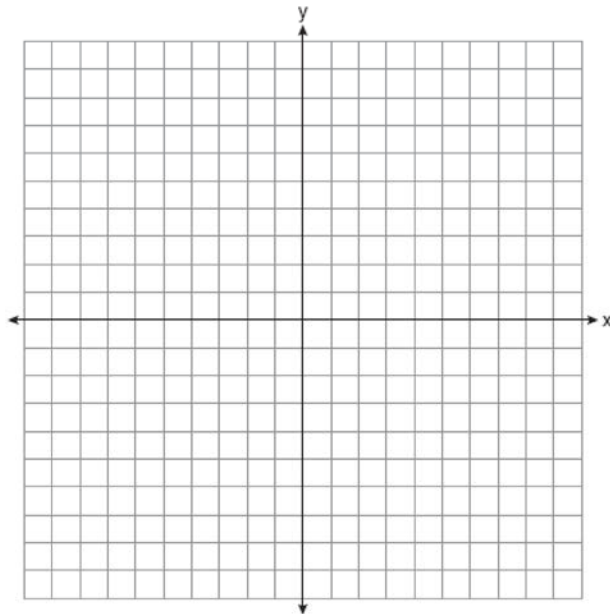Describe the behavior of the given function as x approaches -3 and as x approaches positive infinity.

14 Graph $y = f(x)$, where $f(x) = \log_2(x-1) + 3$ on the set of axes below.

State the equation of the asymptote of $f(x)$. When $f(x)$ is reflected over the line $y = x$, a new function is formed: $g(x) = 2^{x-3} + 1$. State the equation of the asymptote of $g(x)$.

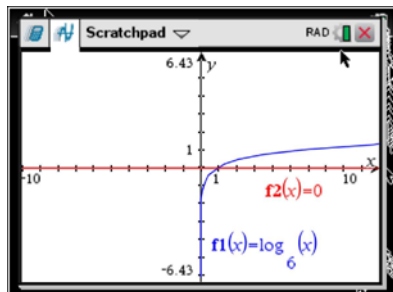15 Graph the following function on the axes below.
$$f(x) = \log_3(2-x)$$

State the domain of f. State the equation of the asymptote.

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Answer Section

1 ANS: 2   REF: 082409aii
2 ANS: 1

    REF: 061618aii
3 ANS: 4   REF: 062215aii
4 ANS: 1   REF: 011902aii
5 ANS: 4

$\log_2(x-1) - 1 = 0$

$\log_2(x-1) = 1$

$x - 1 = 2^1$

$x = 3$

    REF: 061819aii
6 ANS: 1   REF: 062308aii
7 ANS: 2   REF: 081816aii
8 ANS: 4

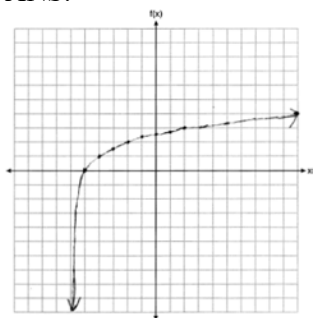Translate the parent log function 2 to the right and reflect over the *x*-axis.

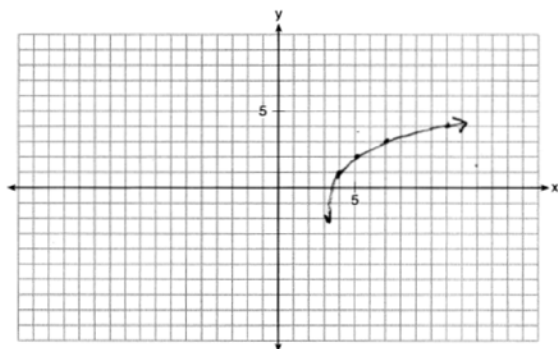   REF: 082207aii
9 ANS:

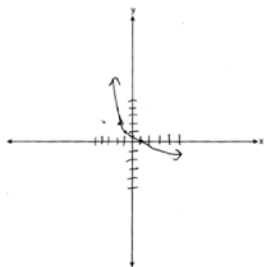left 3, down 5

    REF: 012525aii

10 ANS:

REF: 061927aii

11 ANS:

REF: 011932aii

12 ANS:

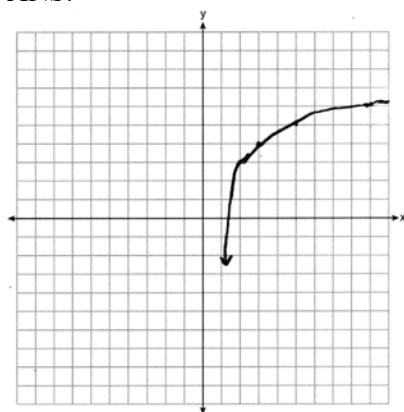As $x \to -3, y \to \infty$. As $x \to \infty, y \to -\infty$..

REF: 082333aii

13 ANS:

As $x \to -3, y \to -\infty$. As $x \to \infty, y \to \infty$.
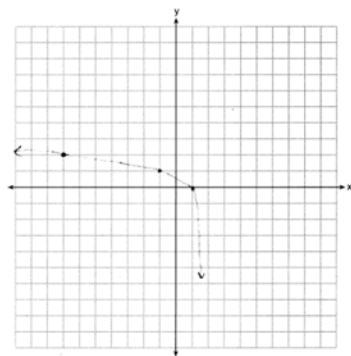
REF: 061735aii

2
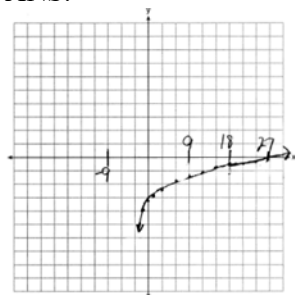
14   ANS:

$x = 1, y = 1$

REF: 062436aii

15   ANS:

Domain: $x < 2$, Asymptote $x = 2$

REF: 012034aii