4.3: (Logarithmic Functions)

If $f(x) = \log_{1/3}(1 - x)$, then $f^{-1}(-1)$ is equal to

A) -2

B) 2

C) 0

D) $\frac{2}{3}$

E) $-\frac{2}{3}$

The interval on which the graph of $f(x) = \left(\frac{1}{2}\right)^{x-2} - 3$ is below the x-axis is

A) $(2 - \log_2 3, \infty)$

B) $(-\infty, 2 - \log_2 3)$

C) $(-2 + \log_2 3, \infty)$

D) $(0, \infty)$

E) $(-\infty, 3 - \log_3 2)$

If $x = e^{(-\ln 3+2\ln 5)}$ and $y = \ln \sqrt[4]{e^5}$, then $x + y =$

(a) $\frac{115}{12}$

(b) $\frac{101}{12}$

(c) $\frac{30}{7}$

(d) $\frac{100}{11}$

(e) $\frac{100}{7}$

The graph of the function $f(x) = |-e^{-x} + 4|$, is decreasing on the interval

A) $(-\infty, -2\ln 2)$

B) $(2\ln 2, \infty)$

C) $(-\infty, \infty)$

D) $(-2\ln 2, \infty)$

E) $(-\infty, 2\ln 2)$

The graph of $f(x) = 3 - 2^{-x}$ is above the x-axis on the interval

A) $(-\log_2\ 3, \infty)$

B) $(-1, \infty)$

C) $(-\infty, 3)$

D) $\left(-\infty, \log_2\ \frac{1}{3}\right)$

E) $(-\log_3\ 2, \infty)$

The graph of the function $y = -\ln\ |x - 2|$ is above the x - axis on

A) $(3, \infty)$

B) $(-\infty, 1)$

C) $(1,3)$

D) $(1,2) \cup (2,3)$

E) $(-\infty, 1) \cup (3, \infty)$

The graph of the function $f(x) = \left|\log_{\frac{1}{2}}(-x+2)\right|$ is increasing on the interval

A) $(1,2)$

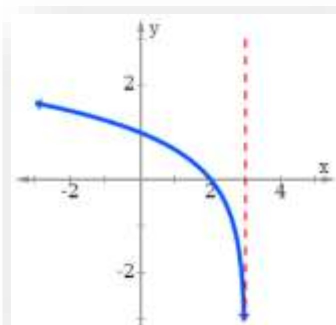
B) $(1,\infty)$

C) $(-1,-2)$

D) $(-\infty,2)$

E) $(-\infty,1)$

If the adjacent figure represents the graph of the function $f(x) = \log_b(a-x)$, then $a+b =$



A) 6

B) 4

C) 3

D) 0

E) 9

The graph of the function $y = -\log\ |2 - x|$ is decreasing on the interval

A) $(2, \infty)$

B) $(-\infty, 2)$

C) $(-\infty, \infty)$

D) $(0, \infty)$

E) $(-\infty, 0)$

The graph of the function $f(x) = |\log_2 (x - 2)|$ is decreasing on the interval

A) $(0,2)$

B) $(-\infty, 2)$

C) $(2,3)$

D) $(3, \infty)$

E) $(-\infty, \infty)$

The domain of the function $f(x) = \log\left(\frac{x+2}{x-1}\right)^2$

A) $(-\infty, -2) \cup (-2,1) \cup (1, \infty)$

B) $(-\infty, 1) \cup (1, \infty)$

C) $(-\infty, -2) \cup (1, \infty)$

D) $(-\infty, \infty)$

E) $(-2,1)$

The domain of the function $y = 1 + \log_2\left(\frac{2-x}{x+1}\right)$ is

A) $(-1,2)$

B) $(-2,2)$

C) $(-\infty, -2) \cup (1, \infty)$

D) $(-\infty, 1) \cup (2, \infty)$

E) $(-\infty, -1) \cup (2, \infty)$

The domain of the function $f(x) = \ln\left(\frac{(1-x)^2}{4x-x^2}\right)$

A) $(0,1) \cup (1,4)$

B) $(0,4)$

C) $(1,4)$

D) $(0,1)$

E) $(-\infty, 0) \cup (1,4) \cup (4, \infty)$

If $(p, 0)$ is the x-intercept and $(0, q)$ is the y-intercept of the graph of $f(x) = \log_{1/3}(3 - x)$, then $p - q =$

A) 3

B) -1

C) 1

D) 2

E) $1/3$

If the domain of $f(x) = \frac{\ln(x^2-x-2)}{\ln(x-2)}$ is $(a, b) \cup (b, \infty)$, then $a + b =$

A) 6

B) 7

C) 4

D) -1

E) 5

If the inverse of $f(x) = 1 + e^{2x-3}$ is $f^{-1}(x) = a + b\ln(x + c)$, then $a + b + c =$

A) 4

B) -2

C) 2

D) 3

E) 1

If $(a, 0)$ and $(0, b)$ are points on the graph of the function $f(x) = \log_3 (x + 1) - 1$, then $a + b =$

A) -2

B) 3

C) 1

D) -1

E) 2

The domain of the function $y = 3 + \log_2 \left(\frac{4-2x}{x-1}\right)$, is

A) $(1,2)$

B) $(-\infty, 1) \cup (2, \infty)$

C) $(-\infty, 1) \cup (1, \infty)$

D) $(-\infty, 1) \cup (4, \infty)$

E) $(1,4)$

The domain, in interval notation, of the function $f(x) = \ln(x - x^2)$ is

A) $(1, \infty)$
B) $(0,1)$
C) $(-\infty, \infty)$
D) $(-\infty, 1)$
E) $(-\infty, 0)$

The graph of $f(x) = -\ln |x + 2|$ lies above the x-axis on the interval

A) $(-3, -2) \cup (-2, -1)$

B) $(-\infty, -3) \cup (-1, \infty)$

C) $(-2, -1) \cup (-1, \infty)$

D) $(-2,0)$

E) $(-3,0)$

The graph of the function $y = \log_2 |x-2| - 1$ is above the x-axis on

A) $(-\infty, 0) \cup (4, \infty)$

B) $(-\infty, 4) \cup (8, \infty)$

C) $(2,6)$

D) $(2, \infty)$

E) $(-\infty, 6)$

The domain of $f(x) = \ln \left|\frac{3}{4-x^2}\right|$ is

A) $(-\infty, -2) \cup (-2,2) \cup (2, \infty)$

B) $(-2,2)$

C) $(-2,0) \cup (0,2)$

D) $(0,2)$

E) $(-\infty, -2) \cup (2, \infty)$

The graph of $y = |\log (x+1)^2|$ is increasing on the interval

A) $(-2,-1) \cup (0,\infty)$

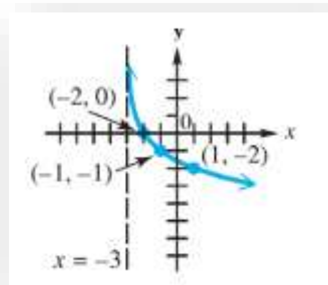
B) $(-\infty,-2) \cup (-1,0)$

C) $(-2,\infty)$

D) $(-\infty,-2)$

E) $(-1,\infty)$

If the adjacent figure is the graph of the function $f(x) = -\log_a (x+b)$ then $a+b =$



A) 5

B) -1

C) 13

D) 6

E) $\frac{7}{2}$

The domain D and the range R of the function $f(x) = \left|\log_{1/3}(2-x)\right| + 1$ are given by

A) $D = (-\infty, 2); R = [1, \infty)$

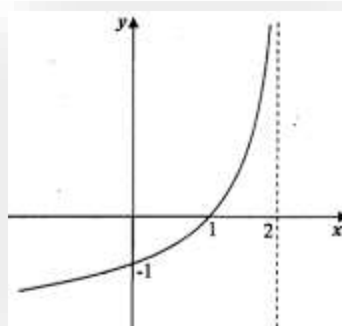
B) $D = (-\infty, \infty); R = [0, \infty)$

C) $D = (-\infty, 2) \cup (2, \infty); R = (-\infty, 1]$

D) $D = (2, \infty); R = (-\infty, \infty)$

E) $D = (-\infty, 1); R = (-\infty, 0]$

The graph given on the right can be represented by



A) $y = \log_2(x-2)$

B) $y = -\log_2 |(2-x)|$

C) $y = -\log_2(3-x)$

D) $y = -\log_2(2-x)$

E) $y = |\log_2(2-x)|$

The graph of the function $y = \log\ |x-2|$ lies below the x-axis over the interval

A) $(-\infty, 1) \cup (3, \infty)$

B) $(0,1) \cup (1,2)$

C) $(1,2) \cup (2,3)$

D) $(-\infty, 1) \cup (2, \infty)$

E) $(1,3)$

The domain of the function $f(x) = \log_4 \left(\frac{|3-x|}{x^2+x-2}\right)$ is

A) $(-\infty, -2) \cup (1,3)$

B) $(-\infty, 3) \cup (3, \infty)$

C) $(-\infty, -2) \cup (1,3) \cup (3, \infty)$

D) $(-2,1) \cup (1,3)$

E) $(-\infty, -2) \cup (3, \infty)$

The function $f(x) = \log_2\left(\frac{3+x}{8}\right)$ is

A) increasing and passing through the quadrants I and IV.

B) decreasing and passing through the quadrants III and IV.

C) increasing and passing through the quadrants II and III.

D) decreasing and passing through the quadrants II, III and IV.

E) increasing and passing through the quadrants I, III and IV.

The domain of the function $f(x) = \ln\left(e^{-x} - e^{x}\right)$ is

A) $(-\infty, \infty)$

B) $(-\infty, 0)$

C) $(-\infty, 0]$

D) $(0, \infty)$

E) $(0,1)$

The domain in interval notation of the function $f(x) = \ln\left|\frac{x-5}{x}\right|$

A) $(-\infty, 0) \cup (5, \infty)$
B) $(-\infty, 0) \cup (0,5) \cup (5, \infty)$
C) $(-\infty, 0) \cup [5, \infty)$
D) $(-\infty, \infty)$
E) $(5, \infty)$

If $f(x) = \log_2 (4 - x)$, which one of the following statements is true?

A) The graph of f is below the x-axis on the interval $(3,4)$.

B) The graph of f is below the x-axis on the interval $(-\infty, 3)$.

C) The domain of f is $(4, \infty)$.

D) The domain of f is $(0, \infty)$.

E) The graph of f is above the x-axis on the interval $(3, \infty)$.

If $f(x) = -\log_{1/2}(-x)$, then

A) the graph of f is decreasing over the interval $(-\infty, 0)$

B) the graph of f neither decreasing nor increasing.

C) Point $\left(\frac{1}{2}, 1\right)$ is on the graph of f

D) the range of f is $(0, \infty)$

E) x-axis is a horizontal asymptote.

The graph of the function $f(x) = \log_{1/3}(3 - x)$

A) is increasing over the entire domain

B) has domain $(-\infty, 0)$

C) has vertical asymptote at $x = 2$

D) has x intercept - 1

E) has range $(0, \infty)$

If $f(x) = \log(x-3)^2$ then:

A) the graph of f is above x-axis on the interval $(-\infty, 2) \cup (4, \infty)$.
B) the graph of f is below x-axis on the interval $(-3,0) \cup (0,3)$.
C) the graph of f is above x-axis on the interval $(3,4)$.
D) the line $x = 0$ is a vertical asymptote of f.

If $f(x) = e^x - 1$, then the graph of $f^{-1}(x)$ lies below the x-axis over the interval

A) $(-1,0)$

B) $(-\infty, 0)$

C) $(-1, \infty)$

D) $(0, \infty)$

E) $(-\infty, -1)$

If $f(x) = \ln(2\sqrt{x} - e)$, then $f\left(e^{2\ln e}\right) =$

A) 1

B) 0

C) e

D) $\ln 2$

E) -1

The graph of the function $f(x) = \log_2 (x-1)^2$ is completely below x-axis on the Interval:

(a) $(0,1) \cup (1,2)$

(b) $(-\infty, -1) \cup (1, \infty)$

(c) $(1,2)$

(d) $(-2, -1) \cup (-1,0)$

(e) $(-\infty, 0) \cup (2, \infty)$

The domain of the function $f(x) = \ln\left(\frac{x-3}{x}\right) - 2$, in interval notation, is:

A) $(-\infty, 0) \cup (3, \infty)$
B) $(-\infty, 0) \cup (0,3)$
C) $(3, \infty)$
D) $(-\infty, 0)$
E) $(0,3)$

If $f(x) = \left(\frac{1}{2}\right)^x - 2$, then $f^{-1}(x)$ is equal to

(a) $\log_{\frac{1}{2}}(x+2)$

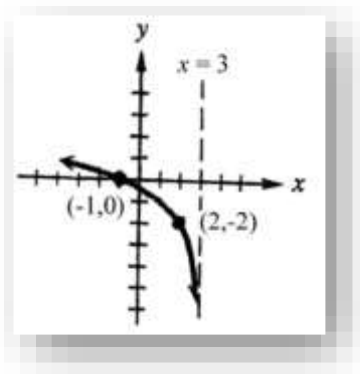
(b) $\log_2\left(x + \frac{1}{2}\right)$

(c) $\log_{\frac{1}{2}}(x-2)$

(d) $\log_2(x-2)$

(e) $\log_{\frac{1}{2}} x$

If the adjacent figure represents the graph of $y = \log_2(-x + a) + b$, then $a + b =$



A) 1

B) 5

C) 3

D) 2

E) $3/2$

If $x = \ln(ke)$ is the x-intercept of the graph of $f(x) = -e^{-x+1} + 2$, then $k =$

A) $\frac{1}{2}$

B) 2

C) e

D) 1

E) $\frac{1}{e}$