

2.8 Recitation Exercises

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1. If the graph of  $f(x) = |x + 1| - 2$ ,  $x \leq k$ , is one-one, then a possible value of  $k$  is equal to  
 A) 0      B) 1      C) -1      D) 2      E) 3
2. For the following functions, find  $f^{-1}(x)$  and state its domain and range
- a)  $f(x) = -\sqrt{4 - x^2}$  for  $-2 \leq x \leq 0$ .
- b)  $f(x) = 2 + \sqrt{3 + x}$  for  $x \geq -3$
- c)  $f(x) = \frac{2x+3}{x-1}$
3. If  $f(x) = -x^2 + 4x$ ,  $x \leq 2$ , then  $f^{-1}(x)$  is
- A)  $y = 2 \pm \sqrt{4 - x}$ ,  $x \leq 4$
- B)  $y = 2 - \sqrt{x - 4}$ ,  $x \geq 4$
- C)  $y = 2 - \sqrt{4 - x}$ ,  $x \leq 4$
- D)  $y = 2 + \sqrt{4 - x}$ ,  $x \leq 4$
- E)  $y = 2 + \sqrt{x - 4}$ ,  $x \geq 4$
4. Let  $f(x) = \frac{3x-k}{x-2}$  and  $f^{-1}(x)$  exists. If  $f^{-1}(-2) = 1$ , then the value of  $k$  is  
 A) -1      B) 1      C) 0      D) -2      E) 2

4.1 & 4.2 Recitation Exercises

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1. If the function  $y = 4^{x+2} - 5$  is written as  $y = k \left(\frac{1}{2}\right)^{bx} + c$ , then  $k + b + c =$

- A) 11                  B) 7                  C) 9                  D) 13                  E) 12

2. Find the intersection points of the graphs of  $y = \left(\frac{1}{3}\right)^{2x+5}$  and  $y = 27$

3. Graph the function. State the domain, range, and asymptote:

a)  $y = 3 - 10^{-x}$

b)  $f(x) = e^{-|x|} - 1$

4. The adjacent figure represents the graph of:

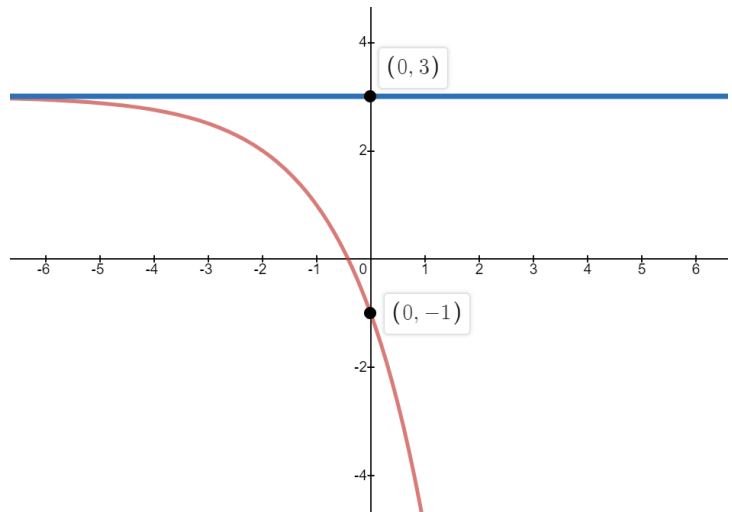
(a)  $y = -\left(\frac{1}{2}\right)^{x+2} + 3$

(b)  $y = \left(\frac{1}{2}\right)^{x+2} - 3$

(c)  $y = -(2)^{x+2} + 3$

(d)  $y = (2)^x + 3$

(e)  $y = (2)^{x-2} + 3$



### 4.3 Recitation Exercises

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1. Use the definition of the logarithmic function to find  $x$  in the following equations:
  - a)  $\log_x 25 = 2$
  - b)  $\log_7 \frac{1}{49} = 3x$
  
2. Find the domain of the following functions:
  - a)  $f(x) = \ln x + \ln(2 - x)$ .
  - b)  $f(x) = \log_3 \left( \frac{x-1}{2-x} \right)$ .
  - c)  $f(x) = \log|x^2 - x|$ .
  
3. Graph the function. State the domain, range, and asymptote:
  - a)  $y = 1 - \log(1 - x)$
  - b)  $y = |\ln x|$
  
4. The graph of  $y = \log_3|x - 3| - 1$  is below the  $x$ -axis on the intervals
  - A)  $(2, 3) \cup (3, 4)$ .
  - B)  $(-\infty, 0) \cup (6, \infty)$ .
  - C)  $(-1, 0) \cup (0, 1)$ .
  - D)  $(0, 3) \cup (3, 6)$ .
  - E)  $(-\infty, 2) \cup (3, \infty)$ .

4.4 Recitation Exercises

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1. If  $\log_{10} 2 = 0.30$ ,  $\log_{10} 3 = 0.48$ , then  $\log_{10} \left(\frac{9}{25}\right) =$
- A)  $-0.24$       B)  $-0.44$       C)  $0.36$       D)  $-0.32$       E)  $-0.28$

2. If  $\log 2 = c$ , then  $\log_8 \sqrt[3]{10} =$
- A)  $\frac{1}{9c}$       B)  $\frac{2}{3c}$       C)  $\frac{c}{9}$       D)  $\frac{1}{c}$       E)  $\frac{3c}{2}$

3. If  $M = -\log_{1/2} \sqrt[4]{2}$  and  $N = \left[\frac{1}{25}\right]^{-2 \log_5 2}$ , then  $N^M =$
- A) 2      B) -2      C)  $\frac{1}{2}$       D)  $-\frac{1}{2}$       E) 4

4. Use the Laws of Logarithms to combine the following expression

$$3 \log_2 x - \frac{1}{3} \log_4 x^{12} + \frac{1}{2} \log_{\frac{1}{2}} x^6, \quad \text{where } x > 0$$

5. If  $a > 0$ ,  $a \neq 1$ ,  $x > 0$ ,  $x \neq 1$ , then simplify the expression

$$(\log_{\sqrt{10}} 1000)(\log_a \sqrt{x})(\log_{x^3} a)$$

**4.5 Recitation Exercises**

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1. Solve the following equations:

a)  $4^x + 2^{1+2x} = 50$

b)  $e^x + 15e^{-x} - 8 = 0$

c)  $\log_2(\log_3 x) = 4$

2. The sum of all solutions to the equation  $\log_2 \sqrt{x} = -\sqrt{\log_2 x}$  is

A) 16

B) 17

C) 1

D) 24

E) 12

3. Find the intersection point(s) between the following functions

$$f(x) = \log_4 8 - \log_4(x + 1) \quad \text{and} \quad g(x) = \log_{16}(x + 1)$$

4. Find the inverse of the following functions

a)  $f(x) = 3^{x+1}$

b)  $f(x) = \log_2(x - 1)$