

King Fahd University of Petroleum and Minerals

Prep-Year Math Program

Math 002 - Term 132

Recitation (4.3)

Question 1: For the function $f(x) = 1 + \log_{1/3}(1-x)$

- 1) find, if any, the x -intercept and the y -intercept and
- 2) find the domain
- 3) find the asymptote(s)
- 4) sketch the graph of $f(x)$
- 5) find the inverse function $f^{-1}(x)$

Solution:

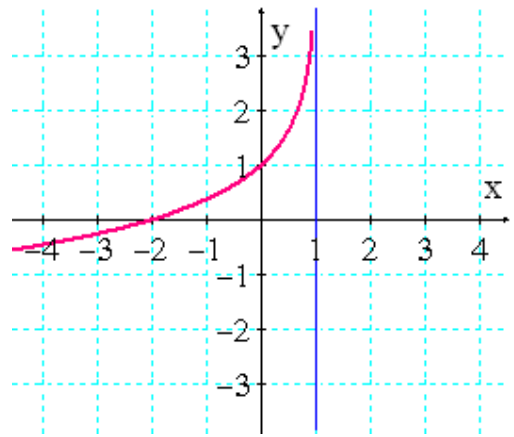
- 1): x -intercept: $x = -2$, $(-2, 0)$
 y -intercept: $y = 1$, $(0, 1)$

2): $D_f = (-\infty, 1)$

3): $x = 1$ is the vertical asymptote.

4):

5): $f^{-1}(x) = 1 - \left(\frac{1}{3}\right)^{x-1} = 1 - 3^{-x+1}$



Question 2: The expression $(\log_3 5)(\log_5 7)(\log_7 81)(\sqrt{2})^{-\log_2 \frac{1}{25}}$ simplifies to:

Answer: 20

Question 3: The expression $\log x^3 y^4 - 3 \log 4 y^2 z + \log 8 x^2 y z$ can be written as:

- a) $\log \frac{8}{3} x^5 y^3$ b) $\log(x^3 y^4 - 12 y^2 z + 8 y z)$ c) $\log \frac{x^5}{8 y z^2}$
- d) $\log 512 x^5 y^{11} z^4$ e) $\log 2 x^5 y^3$

Question 4: 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) $(-\infty, -2) \cup (3, \infty)$

Question 5: The adjacent figure is the graph of:

- a) $y = -\log_3 |x|$ d) $y = \log_3 |-x|$
- b) $y = -|\log_3(-x)|$ e) $y = -\log_3(x)$
- c) $y = -|\log_3 x|$

