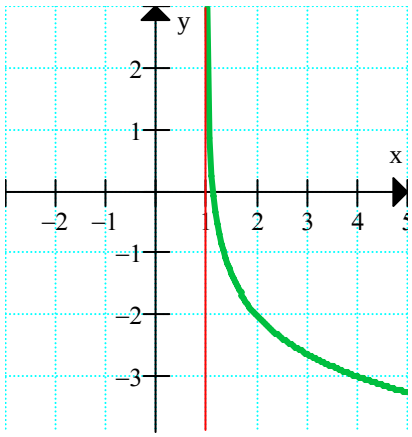
King Fahd University of Petroleum and Minerals
Prep-Year Math Program
Math 002 - Term 151
Recitation (4.3)

Question1 For the function $f(x)=\log_{1/3}(x-1)-2$

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



Answer: **(1):** $x=\dfrac{10}{9}$ **(2):** $D_f=(1,\infty)$

(3): The vertical asymptote: $x=1$ **(4):**

(5): $f^{-1}(x)=\left(\dfrac{1}{3}\right)^{x+2}+1$

Question2: The expression $-\dfrac{2}{3}\log_7(5m^2)+\dfrac{1}{2}\log_7(25m^2)+\log_7\sqrt[4]{25}$ is equal to

Answer: A) $\log_7\dfrac{5^{5/6}}{m^{1/3}}$

Question3

The graph of $y=-\log_{\frac{1}{2}}|x-3|$ is below the x-axis on the interval(s):

a) $(1,\ 3)\cup(3,\ 5)$ b) $(-\infty,\ 2)\cup(4,\infty)$ c) $(2,\ 3)\cup(3,\ 4)$

d) $(-\infty,\ 1)\cup(3,\infty)$ e) $(3,\ \infty)$

Solution: (C): $(2,\ 3)\cup(3,\ 4)$

Question4

The function $y=\log_{(a+1)}(x-2)$ is **defined** when

a) $x>2$ and $a>-1$ b) $x\geq 2$ and $a\geq -1$ c) $x>0$ and $a\neq 1$

d) $x>2$ and $a>-1,\ a\neq 0$ e) $x>0$ and $a>0,\ a\neq 1$

Answer: (d): $x>2$, $a>-1$ and $a\neq 0$

Question5

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

(a) $\log 512x^5y^{11}z^4$ (d) $\log 2x^5y^3$

(b) $\log\dfrac{8}{3}x^5y^3$ (e) $\log(x^3y^4-12y^2z+8yz)$

(c) $\log\dfrac{x^5}{8yz^2}$