

QUIZ # 1 (A)

NAME:  
ID:  
Sec:

1) Let  $f(x) = -\left(\frac{3}{1}\right)^{-x} - 2$ , then find

a) The x-intercept  $y = 0 \Rightarrow -3^x - 2 = -2 \Rightarrow 3^x = 0$

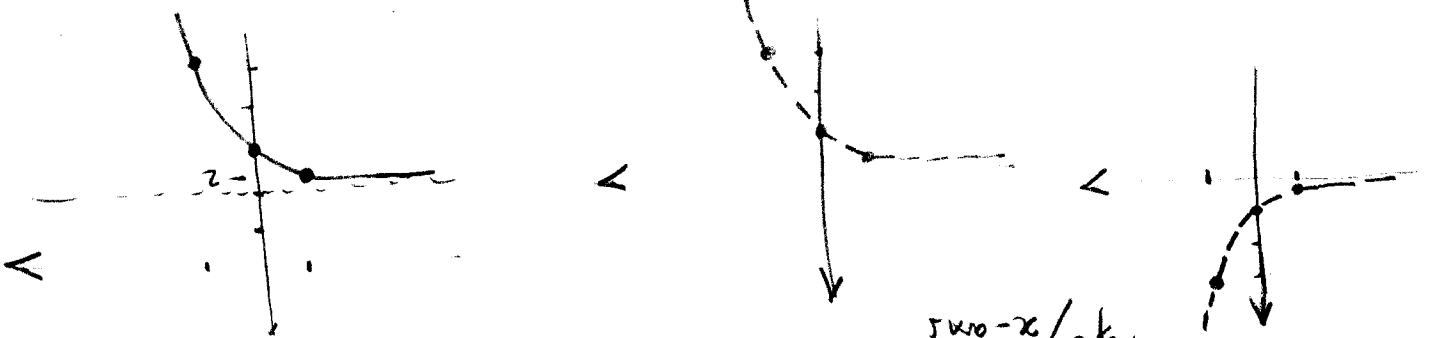
b) The y-intercept  $x = 0 \Rightarrow y = -3^0 - 2 = -3$

c) The range  $(-\infty, -2)$

d) The horizontal asymptote  $y = -2$

e) Using shifts and reflections, draw the graph

$y = 3^x$   
 $y = -3^x$  (Reflection)  
 $y = -3^x - 2$  (Shift 2 down)



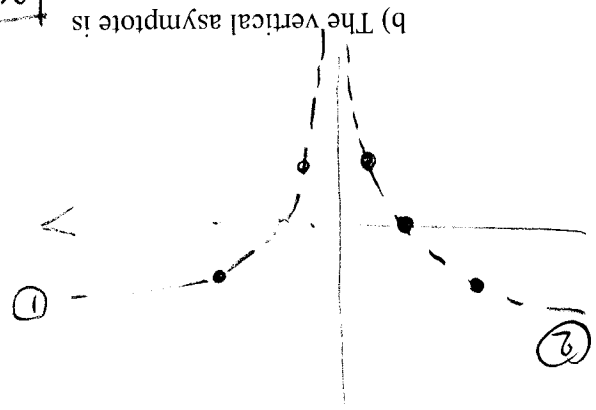
4 pts

2) Let  $g(x) = \log_2(-x+3)$

a) Using translations and reflections sketch the graph

4 pts  $y = \log_2(-(x-3))$

$y = \log_2 x$  (Parent function)  
 $y = \log_2(-x)$  (Reflection)  
 $y = \log_2(-(x-3))$  (Reflection and shift 3 to the right)

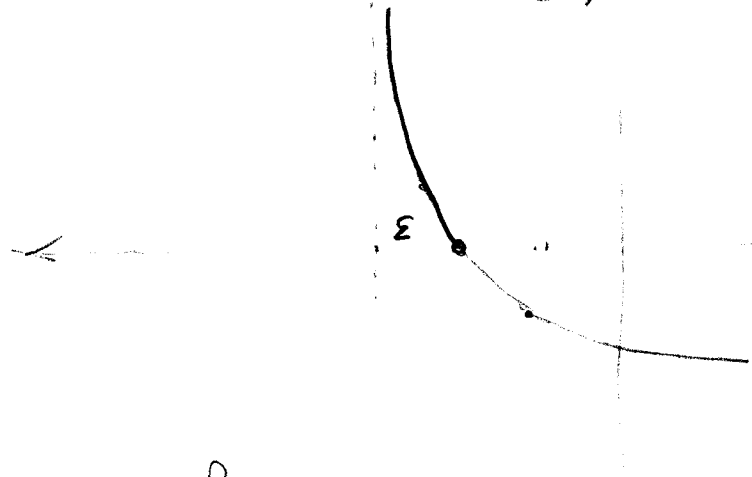


b) The vertical asymptote is

$x = 3$

c) The domain is

$-x+3 > 0 \Rightarrow x < 3$



3) Write as a single logarithm the following

$$\log_2(x+1) - 3\log_2(y-2) + 2$$

$$\log_2(x+1) + \log_2(y-2)^{-3} + \log_2 2^2$$

$$\log_2 \frac{4(x+1)}{(y-2)^3}$$

3pts

4) Let  $m = \ln 2$  and  $n = \ln 3$ , write in terms of  $m$  and  $n$  the expression  $\log_2 \left( \frac{8e^3}{9} \right)$

$$\log_2 \left( \frac{8e^3}{9} \right) = \ln \left( \frac{8e^3}{9} \right) \cdot \frac{1}{\ln 2}$$

$$= \frac{\ln(2^{3/2}) + \ln(e^3) - \ln(9)}{\ln 2} = \frac{\ln 2 - \ln 3}{\ln 2 - \ln 3}$$

$$= \frac{3\ln 2 + 3 - 2\ln 3}{\ln 2 - \ln 3}$$

$$\boxed{\frac{3m - 2n + 3}{m - n}}$$

3pts

5) Find the solution set of  $\log(x+2) + \log(x-1) = 1$

$$\log(x+2)(x-1) = 1$$

$$\log(x^2 + x - 2) = 1$$

$$x^2 + x - 2 = 10^1$$

$$x^2 + x - 12 = 0$$

3pts

6) Find the solution set of  $2^{x^2+8} = (8)^{2x}$

$$2^{x^2+8} = 2^{6x}$$

$$x^2 + 8 = 6x$$

$$x^2 - 6x + 8 = 0$$

$$(x-4)(x-2) = 0$$

$$SS = \{4, 2\}$$

3pts

Check  $x=4$   
 $(x+4)(x-3) = 0$   
 $x=3$   
 $x=4$   
 $\log(-4+2)$  under  
 $\log(-4+2)$  under  
 $x=3$   
 $x=4$   
 $\Rightarrow SS = \{3\}$   
 $x=3$  ✓