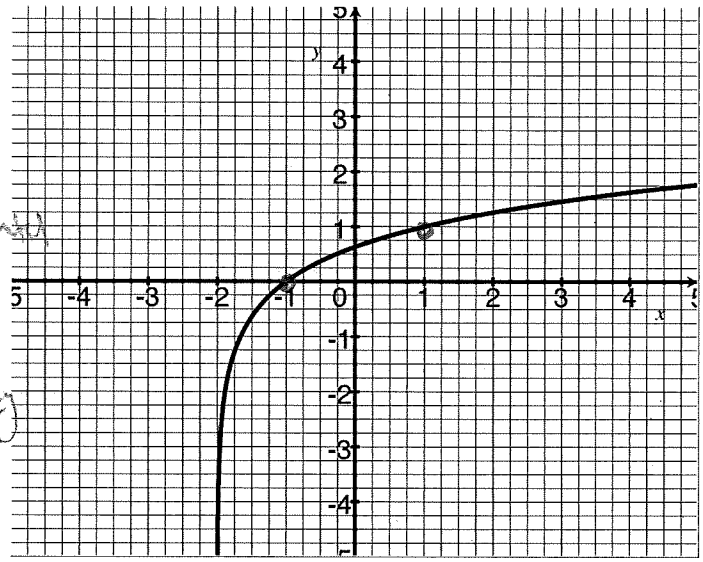
Key

Quiz 3

Show *all* your work. Reasonable supporting work must be shown for any partial credit. There are *two* sides to this quiz.

1. The function g is a logarithmic function graphed below. The logarithmic graph has been shifted horizontally.



   (a) [2] (WebHW9 #2)
   Does g have an inverse?
   Why or why not?

   yes (+1) b/c the graph passes the horizontal line test (+1)

   OR

   yes b/c each output corresponds to exactly one input.

   (b) [3] (WebHW10 #19)
   Find the equation for g.

looks like $\log_b(x+c) = y$ (+.5)

passes thru $(-1,0)$

$\Rightarrow 0 = \log_b(-1+c)$ (+.5)

$\Rightarrow b^0 = -1+c$

$\Rightarrow 1 = -1+c$

$\Rightarrow c = 2$ (+.5)

Correct log to exp (+1)

So $y = \log_b(x+2)$

passes thru $(1,1)$

$\Rightarrow 1 = \log_b(1+2)$

$\Rightarrow 1 = \log_b(3)$

$\Rightarrow b^1 = 3$ (+.5)

So $y = \log_3(x+2)$

OR

the graph of $\log_b(x) = y$ passes thru $(1,0)$ normally (+.5)

(+.5) the graph of g has shifted the point $(1,0)$ left by 2

$\Rightarrow c = 2$ (+.5)

So $y = \log_b(x+2)$

passes thru $(1,1)$

$\Rightarrow 1 = \log_b(1+2)$

$\Rightarrow 1 = \log_b(3)$

$\Rightarrow b^1 = 3$ (+.5)

So $y = \log_3(x+2)$

Correct log to exp (+.5)

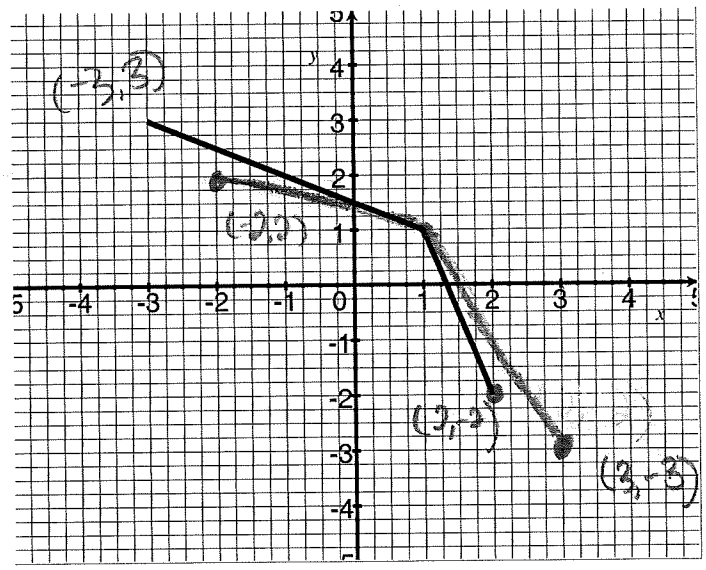
2. [3] (WebHW9 #22) Simplify $\dfrac{x^3\sqrt{y}}{x^{-1}y}$

$$\frac{x^3 x\, y^{1/2}}{y} = x^{3+1} y^{1/2-1} = x^4 y^{-1/2} \text{ or } \frac{x^4}{y^{1/2}} \text{ or } \frac{x^4}{\sqrt{y}}$$

neg exp (+.5)
rational exp (+.5)

combine powers (+1)

3. Let f be the graph given below:



- [1] (InverseActivity #2) What is the range of f.

  y-values (+.5)

  $[-2, 3]$

  end values (+.5)

- [2] (§1.7 #50) Sketch the graph of f^{-1}.

  Swap the x's & y's (+1)

  graph (+1)