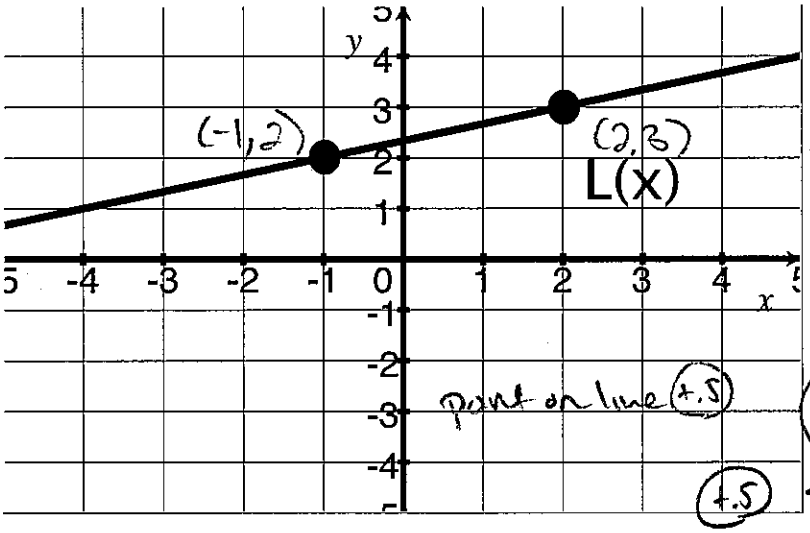
Quiz 2

Key

Show *all* your work. No credit is given without reasonable supporting work. There are *two* sides to this quiz.

1. [2] (WebHW2 #11) Find an equation for the line L shown below.



eq of line (+.5)

Slope: $\frac{\text{rise}}{\text{run}} = \frac{1}{3}$ (+.5)

thru $(-1,2)$ so

$2 = (1/3)(-1) + b$

$\Rightarrow \quad 7/3 = b$

point on line (+.5)

(+.5)

So $y = \frac{1}{3}x + \frac{7}{3}$

or

$y - 2 = \frac{1}{3}(x+1)$

or

$y - 3 = \frac{1}{3}(x-2)$

2. Let $d(x) = \dfrac{x}{\sqrt{x+3}}$ and $j(x) = 2x + 1$.

   (a) [1] (§1.6 #20b) Find the rule of $d - j$.

$$(d-j)(x) = \left(\frac{x}{\sqrt{x+3}}\right) - (2x+1)$$

$$= \frac{x}{\sqrt{x+3}} - 2x - 1$$

subtract (+.5)

parentheses (+.5)

   (b) [1] (§1.6 #28) Evaluate $(d \circ j)(3)$

$$(d \circ j)(3) = d(j(3)) = d(2(3)+1) = d(7) = \frac{7}{\sqrt{7+3}} = \frac{7}{\sqrt{10}}$$

(+.5) (+.5)

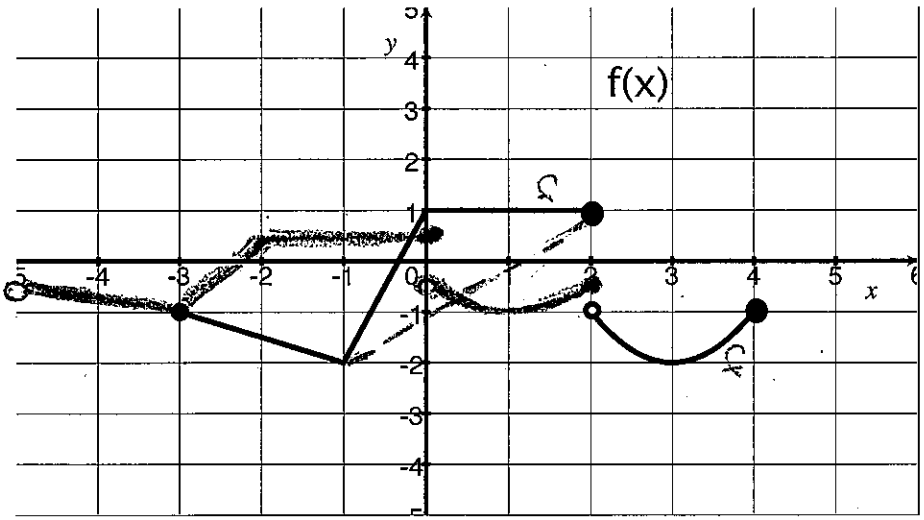
   (c) [1] Find $d \circ j$.

$$(d \circ j)(x) = d(j(x)) = d(2x+1)$$

$$= \frac{2x+1}{\sqrt{2x+1}+3}$$

(+.5) (+.5)

3. Let f be the piecewise defined graph shown below and let the function g be defined by $g(x) = \frac{1}{2}f(x+2)$.



(a) [2] (WebHW2 #14) Find the average rate of change of the function f as x changes from -1 to 2.

i.e. slope of line connecting $(-1, f(-1))$ to $(2, f(-2))$

geometrically: (dotted) drawn above (+.5) (+.5) slope = rise/run (+1) (=1)

algebraically: (+.5 graph reading) (+1) $\frac{f(-1)-f(-2)}{-1-2} = \frac{-2-1}{-3}$ (=1) (+.5)

(b) [3] (Transformation Wks #5) Sketch the graph of g.
Note: partial credit can be earned if you state the graph transformations.

The graph of g looks like the graph of f but (+.5) { horizontally shifted to the left (+.5) 2 units and (+.5) { vertically stretched by a factor of $\frac{1}{2}$. (+.5)

or

note if I didn't know what else to do...

$g(2) = \frac{1}{2}f(2+2) = \frac{1}{2}f(4) = \frac{1}{2}(-1) = -\frac{1}{2} \Rightarrow (2, -\frac{1}{2})$

$g(1) = \frac{1}{2}f(1+2) = \frac{1}{2}f(3) = \frac{1}{2}(-2) = -1 \Rightarrow (1, -1)$

$g(0) = \frac{1}{2}f(0+2) = \frac{1}{2}f(2) = \frac{1}{2}(1) \Rightarrow (0, \frac{1}{2})$

$g(-1) = \frac{1}{2}f(-1+2) = \frac{1}{2}f(1) = \frac{1}{2}(1) \Rightarrow (-1, \frac{1}{2})$

$g(-2) =$

etc...