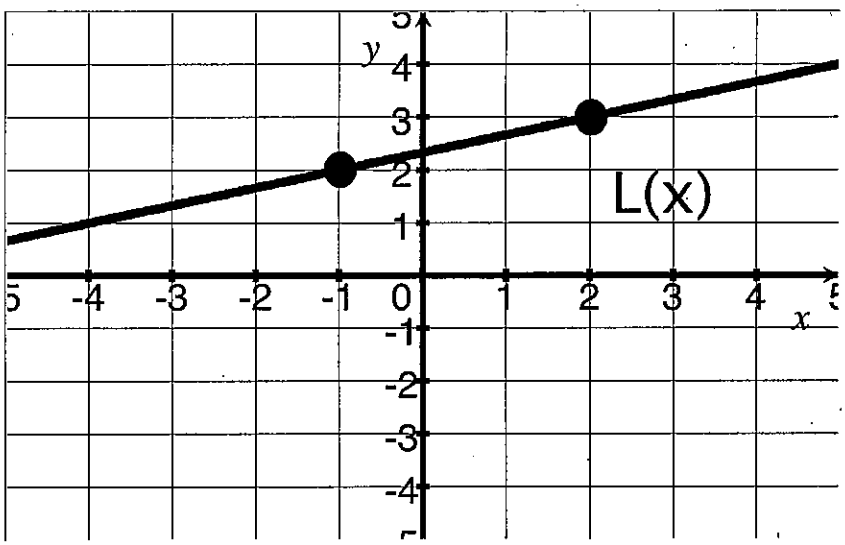
Quiz 2

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

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

or

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

or

b/c passes thru $(-1,2)$

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

$2 + \frac{1}{3} = b$ plug in (+.5)

$\frac{7}{3} = b$ so

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

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

(a) [1] (§1.6 #20c) Find the rule of $d \cdot j$.

$\frac{x}{\sqrt{x+3}} \cdot (2x+1)$

mult (+.5)

parenthesis (+.5)

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

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

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

composition (+.5)

algebra (+.5)

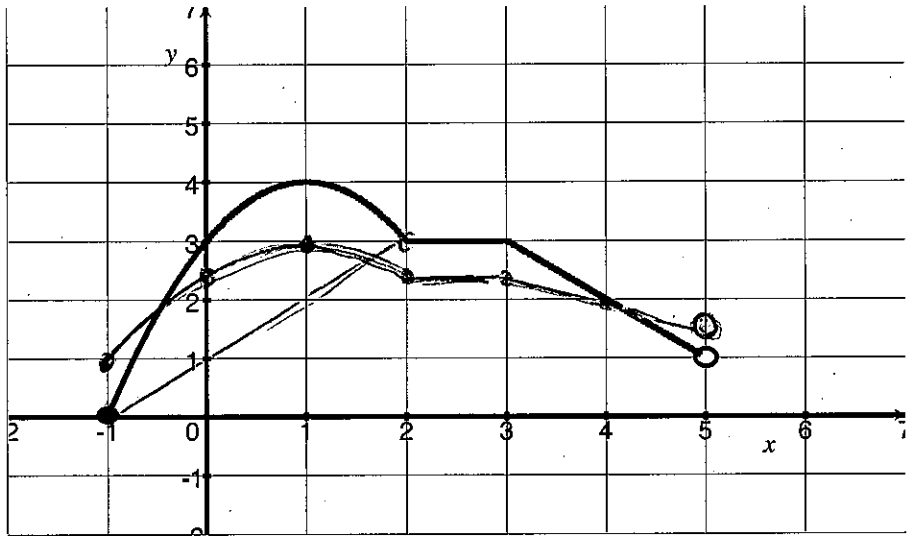
(c) [1] (§1.6 #38) Find $d \circ j$.

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

comp (+.5)

got it (+.5)

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



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

ave rate of change = slope of green line (1)
= rise/run
= 3/3 = 1 (+.5) (+.5)

or

ave rate = $\frac{y_2 - y_1}{x_2 - x_1}$ (+1)
connecting (-1,0) & (2,3) (+.5)
so $\frac{3-0}{2-(-1)} = \frac{3}{3} = 1$ (+1.5)

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

$\frac{1}{2}f(x) + 1$

vertical 'sketch' by 1/2 (+.5)

vertical shift up by 1. (+.5)

Note: vertical sketch must happen first? (+.5)

got + (+1.5)

Plot by plot sketch vert shift

(-1,0) → (-1,0) → (-1,1)

(0,3) → (0, 3/2) → (0, 5/2)

(1,4) → (1,2) → (1,3)

(2,3) → (2, 3/2) → (2, 5/2)

(3,3) → (3, 3/2) → (3, 5/2)

(4/2, 2) → (4, 1) → (4, 2)

(5,1) → (5, 1/2) → (5, 3/2)