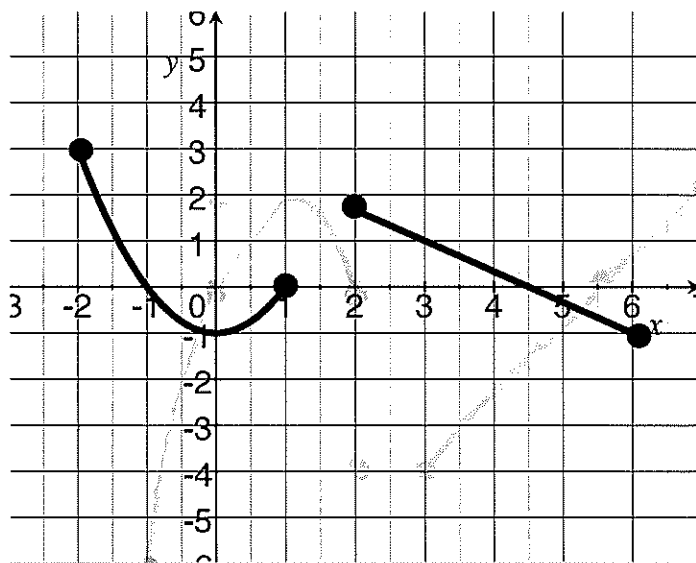


# Quiz 2

Key

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

1. Let  $f$  be the piecewise function consisting of a parabola and a straight line shown in the graph to the right:



- (a) [2] (§2.4 #19d) Sketch the graph of  $-2f(x-1)$

sketch vert by 2 & flip (1)  
 shift to the right by 1 (2)      do on graph (1.5)

- (b) [3] (Worksheets on 10/3 #2 & 10/5 #7) Find a formula for  $f$  in the indicated form:

$$f(x) = \begin{cases} x^2 - 1 & \text{if } -2 \leq x \leq 1 \\ \frac{1}{3}x + 2 & \text{if } 2 \leq x \leq 6 \end{cases}$$

just shifted down 1 (1.5)  
 line thru (2,1) & (6,-1) (1.5)

$$m = \frac{\Delta y}{\Delta x} = \frac{-1-1}{6-2} = -\frac{2}{4} = -\frac{1}{2} \quad (1.5)$$

b/c passed thru (3,1)

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

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

$$3 = b$$

2. (WebHW3 #4) Let  $f(x) = \frac{1}{x}$  and  $g(x) = \frac{10}{x+10}$

(a) [1] Find the  $(f+g)(x)$  and its domain.

$$(f+g)(x) = f(x) + g(x) = \frac{1}{x} + \frac{10}{x+10} \quad (1.5)$$

$$\text{Den } \neq 0 \rightarrow x \neq 0 \text{ and } x+10 \neq 0$$

$$x \neq 0 \rightarrow x \neq -10$$

(4.5)

or  $(-\infty, -10) \cup (-10, 0) \cup (0, \infty)$

(b) [2] Find  $\left(\frac{f}{g}\right)(x)$  and then simplify.

$$\left(\frac{f}{g}\right)(x) = \frac{f(x)}{g(x)} = \frac{\frac{1}{x}}{\frac{10}{x+10}} \quad (1)$$

$$= \frac{1}{x} \cdot \frac{x+10}{10} = \frac{x+10}{10x} \quad (2)$$

(2.5)

3. (§2.7 #45) [2] Find  $f$  and  $g$  so that  $(f \circ g)(x) = (x-9)^5$  (and neither  $f$  nor  $g$  is equal to the  $y = x$  function).

Let  $g$  be  $x-9$

$$g(x) = x-9 \quad (1.5)$$

$$f(x) = x^5 \quad (1.5)$$

$$\text{would work bc } (f \circ g)(x) = f(g(x)) = (x-9)^5$$

Let  $f$  be  $x^5$