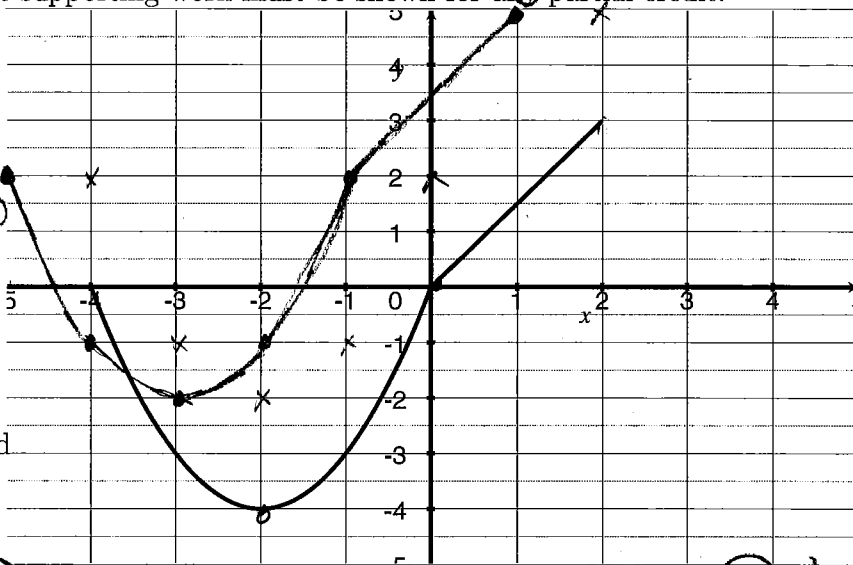


# Quiz 2

Key

Show *all* your work. Reasonable supporting work must be shown for any partial credit.

1. Consider the graph of  $f$  shown on the right.



(a) [1] Find  $(f(f(-2)))$

Handwritten work for (a):  
 $f(-2) = 2$   
 $f(2) = 3$

(b) [3] Given that  $f$  is comprised of a line & a parabola, find the piece-wise defined algebraic rule of  $f$ .

Handwritten piecewise definition:  

$$f(x) = \begin{cases} (x+2)^2 - 4 & \text{if } -4 \leq x \leq -2 \\ \frac{3}{2}x + 0 & \text{if } 0 \leq x \leq 2 \end{cases}$$

Handwritten notes for the line:  
 line  
 slope =  $\frac{\text{rise}}{\text{run}} = \frac{3}{2}$   
 intercept @ 0  
 $\frac{3}{2}x + 0$

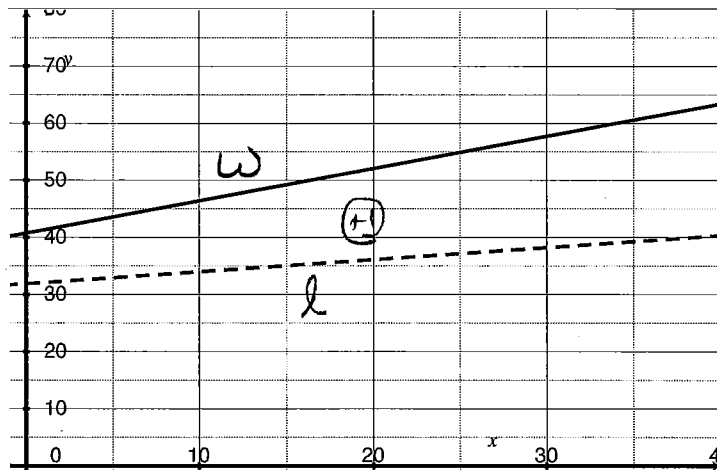
Handwritten notes for the parabola:  
 parabolic  $(+5)x^2$   
 $(+5)$  shifted left 2  $(x+2)^2$   
 $(+5)$  shifted down 4  $(x+2)^2 - 4$   
 Check (0,0)  
 $(0+2)^2 - 4 = 0$  ✓

(c) [3] Graph the function  $g$  defined by  $g(x) = f(x+1) + 2$

2. The functions below (approximately) return the median annual income (reported in thousands of dollars) of Americans since 1960 for white Americans ( $w$ ) and latinx Americans ( $l$ ).

(a) [1] Let  $x$  be the years since 1960, then  $w(x) = .566x + 40.738$ , and  $l(x) = .211x + 31.886$ . Identify which line is  $w$  and which line is  $l$ .

Handwritten note:  $w$  has a y-intercept  $\approx 40$  which is higher than  $l$ 's



(b) [2] Which population is seeing a larger increase in their median annual income? Justify your answer.

(1) White Americans.

(1) The increase corresponds to the slope. White Americans median annual income is increasing at about .566 thousand \$/year as opposed to Latinx Americans whose increase is only .211 thousand \$/yr

Water the 5/16 #36

Week 2: Frick Activity

Webb 1, 4, 1, 5 #9

Line Activity #6