

Wksht 6 Solns

1. a. $f(x) = x^2 + 3x$ -2 to 0

$$f(-2) = 4 - 6 = -2$$

$$f(0) = 0$$

$$\text{avg rate of change} = \frac{f(0) - f(-2)}{0 - (-2)}$$

$$= \frac{0 - (-2)}{0 - (-2)} = 1$$

b. $g(-1) = (-1)^2 = 1$
 $g(3) = 3^3 = 27$

$$\text{avg rate of change} = \frac{g(3) - g(-1)}{3 - (-1)} = \frac{27 - 1}{4} = \frac{13}{2}$$

c. output at $x = -1$ is 1 $\rightarrow (-1, 1)$
 output at $x = 1$ is 2 $\rightarrow (1, 2)$

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

2. piecewise function

$$\begin{cases} x+2 & -2 \leq x \leq 0 \\ 2 & 0 < x \leq 2 \end{cases}$$

(calculate slope and y-int on each piece.)

3. a $f(-x) = (-x)^3 + 4(-x)$
 $= -x^3 - 4x$
 $= -f(x)$

odd

3. c. $h(-x) = 3(-x)^5 - (-x) + 1$
 $= -3x^5 + x + 1$

b $g(-t) = 3(-t)^4 + 1$
 $= 3t^4 + 1 = g(t)$ even

$h(x) = 3x^5 - x + 1$ | $-h(x) = -3x^5 - x - 1$
 neither

4. $f(x) = 3x - 2$

a. lots of answers, $y = 3x$ (or $y = 3x + c$)

b. has $m = 3$
 goes thru $(4, 0)$ so $y = 3x + b$
 $0 = 3(4) + b \Rightarrow y = 3x - 12$
 $-12 = b$

c. $m = -1/3$
 $(4, 0)$ $y = -1/3x + b$
 $0 = -1/3(4) + b$ $b = 4/3$ $y = -1/3x + 4/3$

4d $x=2$ is vertical line.

A perpendicular line is horizontal. So $m=0$

$y=0x+b$ goes thru $(-1,3)$ so $3=0(-1)+b$
 $3=b$

$y=3$

e. goes thru $(4,0)$ & $(-5,-1)$

$m = \frac{\Delta y}{\Delta x} = \frac{0 - (-1)}{4 - (-5)} = \frac{1}{9}$ $y = \frac{1}{9}x + b$
 $(4,0):$ $0 = \frac{1}{9}(4) + b$
 $b = -\frac{4}{9}$

$y = \frac{1}{9}x - \frac{4}{9}$

5. $4y + 2x = -5$
 $-2x$ $-2x$

$\frac{4y}{4} = \frac{-2x}{4} - \frac{5}{4}$
 $y = \frac{-1}{2}x - \frac{5}{4}$

$3y + ax = -2$
 $-ax$ $-ax$

$\frac{3y}{3} = \frac{-ax - 2}{3}$
 $y = \frac{-a}{3}x - \frac{2}{3}$

perp slope is $m=2$

so $-\frac{a}{3} = 2$

$a = -6$

6. a. value = $85 + 1.50(t)$

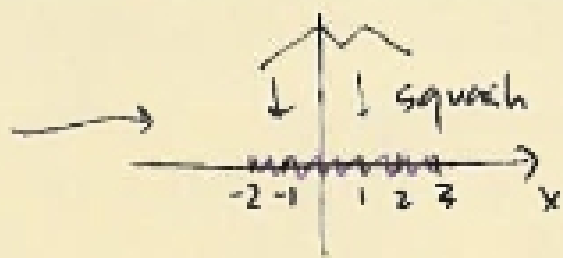
value after 7 yrs = $85 + 1.5(7)$
 $= 85 + 10.5$
 $= 95.50$

$t = \#$ years after purchase

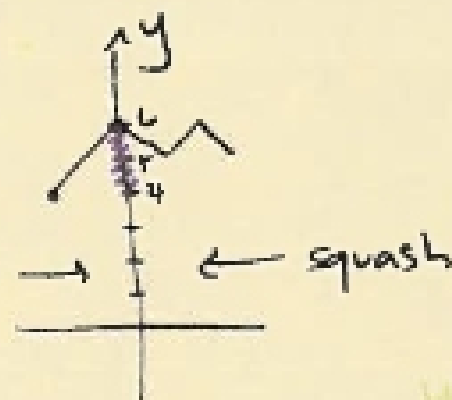
b. $100 = 85 + 1.5t$
 -85 -85

$15 = 1.5t$
 $\frac{15}{1.5} = \frac{1.5t}{1.5}$
 $t = 10$ yrs

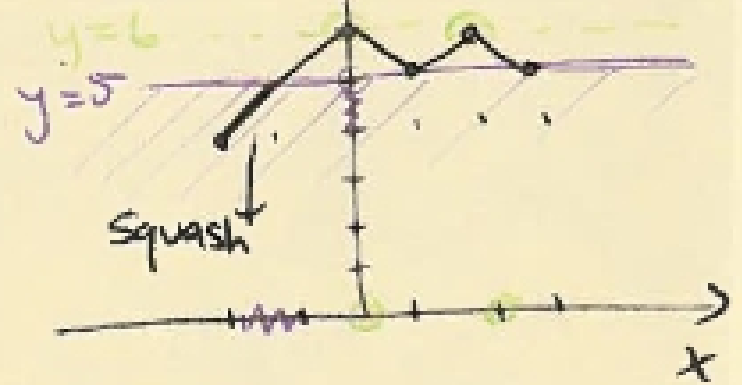
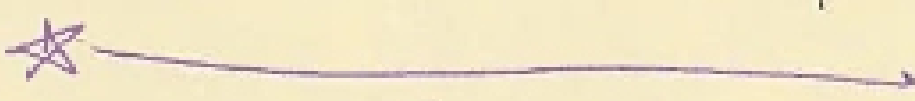
7. a. $[-2, 3]$



b. $[4, 6]$



c. $[-2, -1)$



d. $x=0, 2$



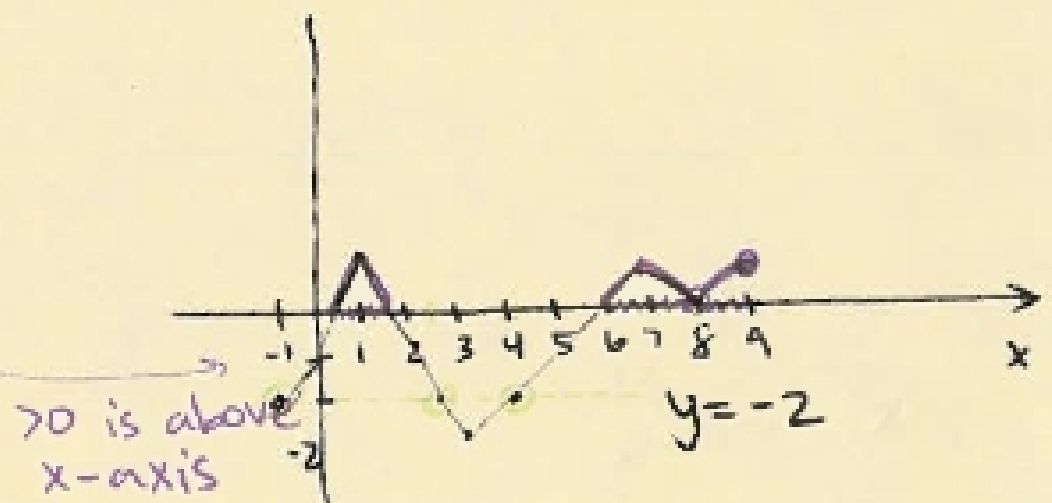
8. a. $[-4, 9]$

squash to x-axis

b. $[-4, 1]$

squash to y-axis

c. $(\frac{1}{2}, \frac{3}{2}) \cup (6, 8) \cup (8, 9]$



d. $x=-1, \frac{5}{2}, 4$

