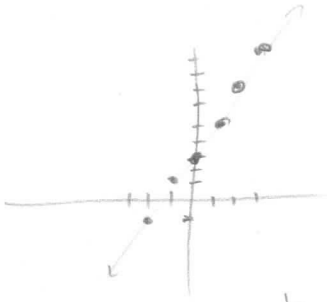
2.1

July 8th

(9) $y = 2x + 3$

x	-2	-1	0	1	2	3
y	-1	1	3	5	7	9

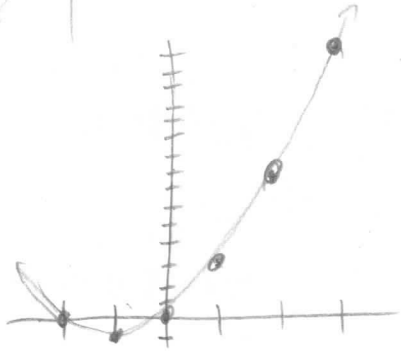


domain $= \{-2, -1, 0, 1, 2, 3\}$

range $= \{-1, 1, 3, 5, 7, 9\}$

(13) $y = x(x+2)$

x	-2	-1	0	1	2	3
y	0	-1	0	3	8	15

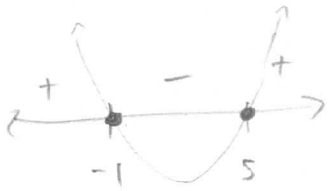


domain $= \{-2, -1, 0, 1, 2, 3\}$

range $= \{0, -1, 3, 8, 15\}$

(29) $f(x) = \sqrt{x^2 - 4x - 5}$, $x^2 - 4x - 5 \geq 0$

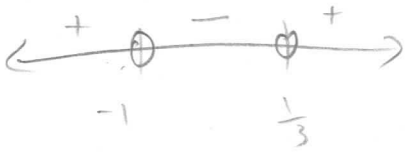
$(x-5)(x+1) \geq 0$



domain $(f) = (-\infty, -1] \cup [5, \infty)$

(31) $f(x) = (3x^2 + 2x - 1)^{-1/2}$, $3x^2 + 2x - 1 > 0$, $3x^2 + 2x - 1 = 0 \Leftrightarrow x = \frac{-2 \pm \sqrt{4+12}}{6}$

$= \frac{1}{3}, -1$



domain $(f) = (-\infty, -1) \cup (\frac{1}{3}, \infty)$

(53) $f(x) = 2x^2 - 4x - 5$

(a) $f(x+h) = 2(x+h)^2 - 4(x+h) - 5$

(b) $f(x+h) - f(x) = (2(x^2 + 2xh + h^2) - 4(x+h) - 5) - (2x^2 - 4x - 5)$

$= 4xh + 2h^2 - 4h$

(c) $\frac{f(x+h) - f(x)}{h} = \frac{4xh + 2h^2 - 4h}{h} = 4x + 2h - 4$

(67) $f(x) = \frac{1}{x^2+4}$ is <u>even</u>, $f(-x) = \frac{1}{(-x)^2+4} = \frac{1}{x^2+4} = f(x)$

(69) $f(x) = \frac{x}{x^2-9}$ is <u>odd</u> $f(-x) = \frac{-x}{(-x)^2-9} = -\left(\frac{x}{x^2-9}\right) = -f(x)$

(73)

(a) $f(250000) = .4(150000) + .333(100000)$

$=$

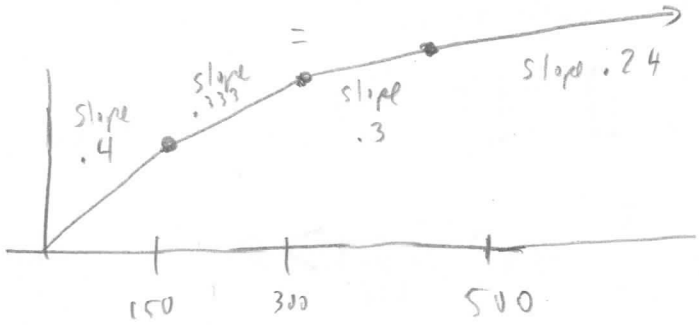
(b) $f(350000) = .4(150000) + .333(150000) + .3(50000)$

$=$

(c) $f(550000) = .4(150000) + .333(150000) + .3(200000) + .24(50000)$

$=$

(d)

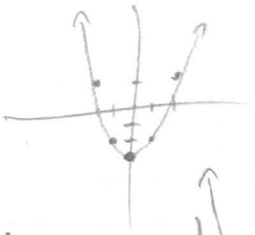


piecewise linear

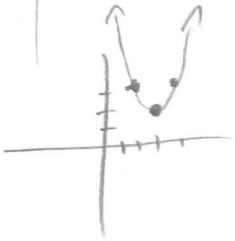
2.2

July 8th

(3) $y = x^2 - 3$ D

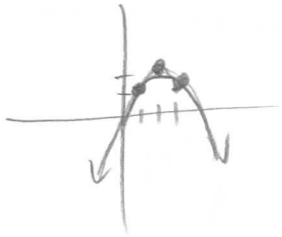


(5) $y = (x-3)^2 + 2$ A



(7) $y = -(3-x)^2 + 2$

$= -(x-3)^2 + 2$ C



(11) $y = -2x^2 + 8x - 9 = -2(x^2 - 4x) - 9 = -2(x^2 - 4x + 4 - 4) - 9$

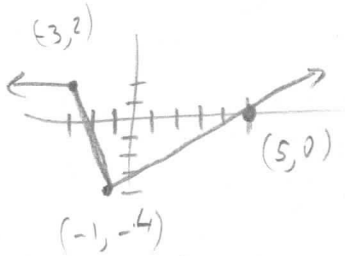
$= -2(x-2)^2 - 1$ vertex $(2, -1)$

(17) $f(x) = 2x^2 + 8x - 8 = 2(x^2 + 4x) - 8 = 2(x^2 + 4x + 4 - 4) - 8$

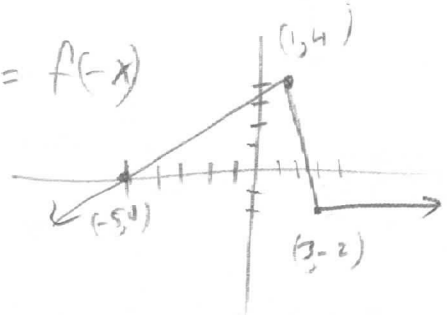
$= 2(x+2)^2 - 16$ vertex $(-2, -16)$ axis $x = -2$

x-intercepts $x = \frac{-8 \pm \sqrt{64+64}}{4} = -2 \pm 2\sqrt{2}$ y-intercepts $x = 0 \Rightarrow y = -8$

(31) $y = -f(x)$

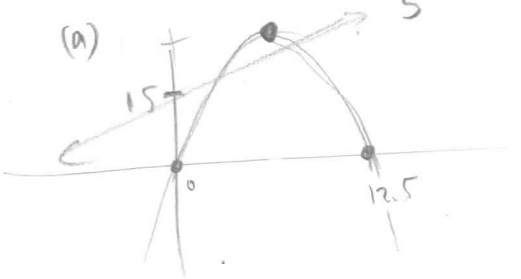


(33) $y = f(-x)$



(51) $R(x) = -\frac{4}{5}x^2 + 10x$, $C(x) = 2x + 15$

(a)



(b) min break even $C(x) = R(x)$, $-\frac{4}{5}x^2 + 8x - 15 = 0$, $x =$

(c) max rev, $x = \frac{-b}{2a} = \frac{-10}{-\frac{8}{5}} = 6.25$, $R(6.25) = 31.25$

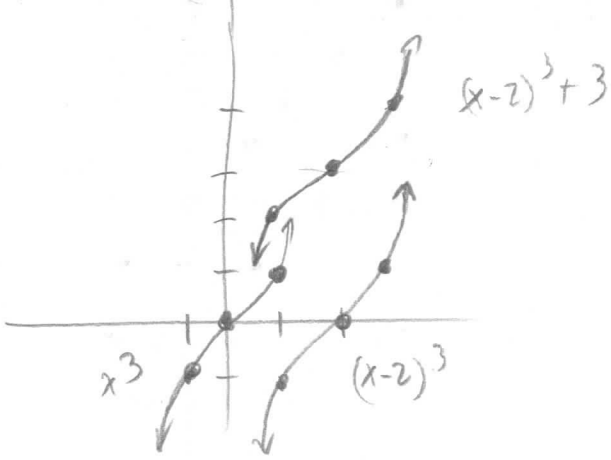
vertex of $R(x)$

(d) max profit, $R(x) - C(x) = -\frac{4}{5}x^2 + 8x - 15$, $x = \frac{-8}{-\frac{8}{5}} = 5$

$P(5) = 5$

2.3

(3) $f(x) = (x-2)^3 + 3$



(13) $y = -x^4 + 7x^3 + 10x + 15$

4th degree, opens down, must be G

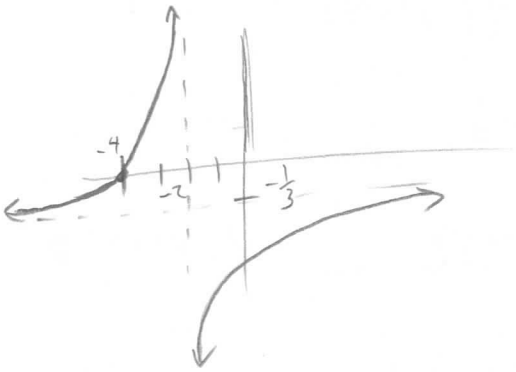
(15) $y = -x^5 + 4x^4 + x^3 - 16x^2 + 12x + 5$

5th degree,  , must be A

(37) $y = \dfrac{-x-4}{3x+6} = \dfrac{-(x+4)}{3(x+2)}$

horiz. asymp. $y = -\frac{1}{3}$

vert. asymp $x = -2$



(39) $y = \dfrac{x^2+7x+12}{x+4} = \dfrac{(x+3)(x+4)}{x+4} = x+3$ for $x \neq -4$

- no vert/horiz asymp.
- "hole" at $(-4, -1)$