# Assignment #22

4/10/2001

## 23.2

(#2) a) B. With zero as the anchor point, $\int_0^x f(t)dt$ will increase as $x$ moves away from 0.

We know that ${}_0A_{f(0)} = 0$.

b) D. We know that ${}_2A_{f(0)}$ is negative because $\int_2^0 f(t)dt < 0$ (look @ limits of integration!)

It should increase as $x$ moves away from 0.

(#3) a) C; we know that $\int_0^{-1} f(t)dt < 0$.

we know $F(0) = 0$, we know $F(1) > 0$.

b) C; we know that $\int_{-2}^{-1} f(t)dt < 0$,

so $F(-1) < 0$

## 23.3

(#1) a) $F(x)$ increasing on: $[-4,0] \cup [4,6]$
decreasing on: $[-6,-4] \cup [0,2] \cup [2,4]$
concave up on: $[-6,-2] \cup [1,2] \cup [3.5,6]$
concave down on: $[-2,1] \cup [2,3.5]$

b) $G(x)$ increasing on: $[-6,-4] \cup [0,1] \cup [4,6]$
decreasing on: $[-4,0] \cup [1,2] \cup [2,4]$

c) @ $x = -4, 4$

d) they both occur where $f(t)$ crosses the $x$-axis

e) similar shapes on $x \geq 1$

opposite (increasing vs. decreasing) on $x \leq 1$

(#3) a) $\int_{-2}^{6} r(t)\,dt = \int_{-2}^{7} r(t)\,dt - \left[\int_{2}^{7} r(t)\,dt - \int_{2}^{6} r(t)\,dt\right]$

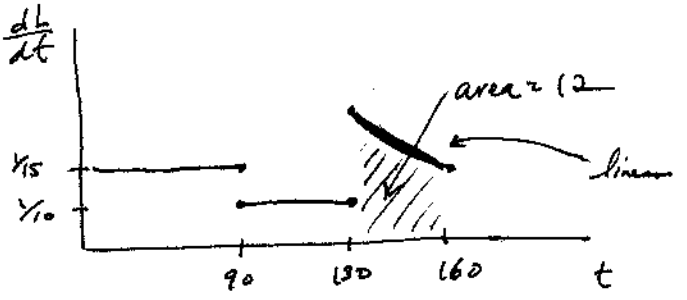
$\int_{6}^{7} r(t)\,dt$

$= 4 - (1 - 0) = 3$

b) we want: $\int_{2}^{7} r(t)\,dt$ to know how much water was added AFTER 2:00 pm.

$50 + 1 = \boxed{51}$

(#4) a)




b)