1. AP Calculus AB 2004 #5 (No Calculator)

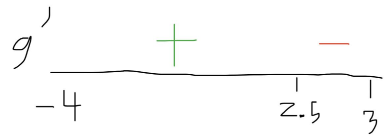
a. g(0)= 3+ (3*1)/2 = 4.5, g'(0)=f(0)=1
b. There is a relative maximum at x=3 on the open interval (-5,4) because f changes from positive to negative.
c. Candidates for the absolute minimum value of g on the closed interval [-5,4] are the endpoints and relative minimums. The candidates are x=-5,-4,4.
   g(-5) = 1-1=0
   g(-4)= $\int_{-3}^{-4} f(t)\,dt$= -(2/2)=-1
   g(4)= $\int_{-3}^{0} f(t)\,dt + \int_0^2 f(t)dt + 0$= 4.5+(-pi+4)/2
   Therefore, the absolute minimum value of g on the closed interval is -1.
d. On the open interval (-5,4), g has a point of inflection on x=-3,1,2

2. AP Calculus AB 2007 #4 (No Calculator)

a. On the domain (-5,5), f has a relative maximum at x=-3,4 because f' changes from positive to negative at x=-3,4.
b. f has points of inflection at x=-4,-1,2 because f' changes from increasing to decreasing or vice versa at x=-4,-1,2.
c. f is concave up and has a positive slope when f' is positive and increasing. The intervals of f that are concave up and have a positive slope are (-5,-4) and (1,2).
d. On the interval [-5,5], Candidates for the absolute minimum value are the endpoints and relative minimums. There is a relative minimum at x=1 because f' goes from negative to positive at x=1. Our candidates are -5,1,5.
   f(-5)= 3+($\int_1^{-5} f'(x)\,dx$)= (-pi/2 + 2pi)+ 3
   f(1) = 3
   f(5) = 3 + ($\int_1^5 f'(x)\,dx$) = (2/2 + 4/2 - 1/2) +3

3. AP Calculus AB 2011 #4 (No Calculator)

a. g(-3) = $\int_0^{-3}$ -6= -6-($3^2\pi$)/4
   g'(x) = 2+ f(x)
   g'(-3) = 2+f(-3) = 2
b. Candidates for the absolute maximum on the interval [-4,3] are the endpoints and the relative maximum(s). There is a relative maximum on g



at x=2.5. Because g was increasing from (-4, 2.5) and decreasing from (2.5, 3), x=2.5 is the absolute maximum of g.

c. On the interval (-4,3), g has a point of inflection at x=0 because g' goes from increasing to decreasing at x=0.

d. The average rate of change of f on the interval [-4,3] is $f(3) - f(-4)/(3+4)$ = -2/7.
MVT only works when a function is differentiable on its domain. f is not differentiable at x=0.