1. Find the c in [0, 3] guaranteed by the Mean Value Theorem for the function .
2. Find where the previous function is increasing.
3. Let 
4. Find the critical values. <Hint: Divide g’(x) by 6 will make it easier to factor>
5. Classify the critical values as local max, local min, or neither.
6. Prove your answer to b) is correct using the first or second derivative test.
7. Where is g(x) concave up?
8. Where is the inflection point?

answers

1. f’(x) = 6x+1 = [f(3)-f(0)]/(3-0) = 30/3 = 10 so x = 9/6
2. 6x + 1 = 0 when x = -1/6 f’(-1) < 0 and f(1) > 0 so answer is (-1/6, +oo).
3. a) 1/6 of g’(x) = =(x-1)(x-2)=0 when x = 1 or x=2.

b) local max at x = 1 and local min at x = 2

c) First derivative test

---------------- 1 --------------- 2 ----------------------

g’(0)= 12 > 0 g’(1.5) <0 g’(3) > 0

increasing decreasing increasing

local max local min

at x =1 at x = 2

Second derivative test g’’(1) = 12(1) - 18 <0 and g”(2) = 12(2) -18 > 0

local max local min

at x =1 at x = 2