9. (4 points) Let f, g be functions such that $f''(x) > 0$ and $g''(x) < 0$ for all x. In how many points can the graphs of f and g intersect? Circle all possible answers.

(i) no points

(ii) 1 point

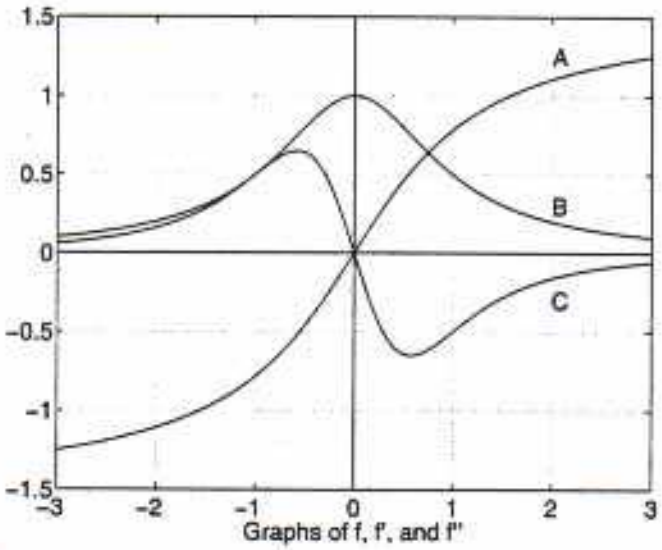
(iii) 2 points

(iv) 3 points

(v) infinitely many points

NPC

10. (7 points) (a) The figure below shows graphs of a function f and its first and second derivatives, f' and f''. Identify by the label on the graph which function is f, which is f', and which is f''.



A is the graph of f

B is the graph of f'

C is the graph of f''

(b) Give a clear explanation of your reasoning for the choices you made in part (a).

Graph A cannot be the derivative of any other function since all functions are decreasing for $x < 0$. Thus, A is f. Since A is increasing for all x, & B is positive for all x, B is f'. Graph C is positive when B is increasing (& when A is concave up) & C is negative when B is decreasing (& when A is concave down, so C is f''.