

8. (8 points) Consider the family of functions of the form

$$f(x) = x + ax \ln(bx).$$

- (a) Under what conditions on a and b is the function f defined and concave down for positive values of x ? Explain. [Note: to receive credit, your work must be shown analytically, not just in the form of a graph.]

- (b) For what value(s) of x (if any), will f have a critical point?