

7. [9 points] Consider the family of functions given by  $f(x) = e^{x^2+Ax+B}$  for constants  $A$  and  $B$ .
- a. [6 points] Find and classify all local extrema of  $f(x) = e^{x^2+Ax+B}$ . Use calculus to find and justify your answers, and be sure to show enough evidence to demonstrate that you have found all local extrema. For each answer blank, write NONE if appropriate. Your answers may depend on  $A$  and/or  $B$ .

**Answer:** Local min(s) at  $x =$  \_\_\_\_\_

**Answer:** Local max(es) at  $x =$  \_\_\_\_\_

- b. [3 points] Find exact values of the constants  $A$  and  $B$  so that the point  $(3, 1)$  is a critical point of  $f(x) = e^{x^2+Ax+B}$ .

**Answer:**  $A =$  \_\_\_\_\_ and  $B =$  \_\_\_\_\_