7. [9 points] Consider the family of functions

$$m(x) = x + \frac{c^2}{x}$$

defined for $x > 0$, where c is a positive constant.

Throughout this problem, use calculus to find your answers, show all your work, and be sure to show enough evidence to justify your conclusions.

a. [2 points] Any function in this family has only one critical point on its domain $x > 0$. In terms of c, what is the x-coordinate of this critical point?

Answer: _____

b. [3 points] Is the critical point a local minimum, a local maximum, neither, or is there not enough information to decide? Circle your answer below.

Answer: local min   local max   neither   not enough info

c. [2 points] Find the x-coordinates of all inflection points of $m(x)$, or if there are none, write NONE.

Answer: Inflection point(s) at $x =$ _____

d. [2 points] Find the value for c such that $m(x) = 10$ at its critical point.

Answer: $c =$ _____