(7.) The function $f(x) = x\ ln(x)$ has one critical point on the interval (0, 5).

(a) (4 pts) Determine the **exact** x value (i.e., not a decimal approximation) for the location of this critical point.

x = _____

(b) (3pts) Is this point a maximum or a minimum or neither of these? Explain and show your work.

(c) (2 pts) Determine the instantaneous rate of change of f at $x = 1$ and at $x = 2$.

@ $x = 1$ _____

@ $x = 2$ _____

(d) (2 pts) What do the values in part (c) suggest about the concavity of the function between $x = 1$ and $x = 2$? Explain.

(e) (3 pts) Determine an equation of the tangent to the graph of f at $x = 1$.

_____

(f) (2 pts) Use your equation from part (e) to approximate $f(2)$.

(g) (2 pts) Should your estimate be an underestimate or an overestimate? _____ Why?