§2.4 #9. Continuity

a. State the three part definition for continuity of a function f at a number a.

b. Sketch the graph of f.

$$f(x) = \begin{cases} 2^x & \text{if} \quad x < 1 \\ 1 & \text{if} \quad x = 1 \\ -(x-1)^2 + 2 & \text{if} \quad 1 < x \end{cases}$$

c. For which value of x is f discontinuous? Which requirement fails?