NAME :

Quiz 0

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(a) Two cups of coffee are initially at different temperatures T_1 and T_2. They are left in a room where the ambient temperature is T_0, such that $T_0 < T_1 < T_2$. On the same graph, draw qualitative sketches of each of their temperatures as a function of time. On this sketch, indicate when thermal equilibrium has (roughly) been reached. [3]

(b) Describe what extensive and intensive variables are. Classify the following quantities as extensive or intensive using your definition: internal energy U, volume V, number of particles N, temperature T, and pressure P. [3]

(c) Compute the partial derivatives $\left(\partial f/\partial y\right)_x$ and $\left(\partial f/\partial x\right)_y$ for the following functions:

(i) $f(x,y) = x^3 y^2$ [2]

(ii) $f(x,y) = 2y\log x + (y-1)^2$ [2]