Accessible regions of phase space

a.

b.
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c. \[ \frac{1}{2m}(p_1^2 + p_2^2) = E \] whence \[ p_1 = \pm \sqrt{2mE - p_2^2} \]

d. For the position variables, the accessible region is an N-dimensional cube, each edge of length \( L \).
For the momentum variables, the accessible region is an N-dimensional shell, with inner radius \( \sqrt{2mE} \) and outer radius \( \sqrt{2m(E + \Delta E)} \).