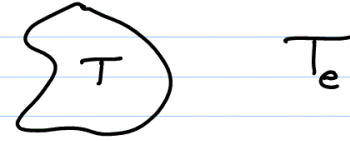


A. Work done (or released) in moving a parcel vertically.

Buoyancy force per unit mass $a = g \frac{T - T_e}{T_e} = g \frac{\Delta T}{T_e}$



If a parcel ascends from z_1 to z_2 then the work done (per unit mass) is

$$W \left[\frac{\text{J}}{\text{kg}} \right] = \int_{z_1}^{z_2} g \frac{\Delta T(z)}{T_e} dz \approx \frac{g}{T_e} \int_{z_1}^{z_2} \Delta T(z) dz$$

$$\approx \frac{1}{27} (z_2 - z_1) \overline{\Delta T}$$

$$\text{CAPE} = \frac{g}{T_e} \int_{\text{LFC}}^{\text{LNB}} \Delta T(z) dz$$

$$\text{CIN} = \frac{g}{T_e} \int_{?}^{\text{LFC}} \Delta T dz$$

