

For the Troposphere

$$h = \frac{T_0}{-\left(dT/dh\right)} \cdot \left[1 - \left(\frac{P}{P_0} \right)^{\frac{-(dT/dh) \cdot R}{gM}} \right]$$

where

- h = geopotential altitude (above sea level) (in meters)
- P_0 = standard atmosphere pressure = 101325Pa
- T_0 = 288.15K (+15°C)
- dT/dh = -0.0065 K/m: thermal gradient or standard temperature lapse rate
- R = 8.31432 Nm/mol K (Current NIST value 8.3144621)
- g = 9.80665 m/s²
- M = 0.0289644 kg/mol

From 1976 US Standard Atmosphere