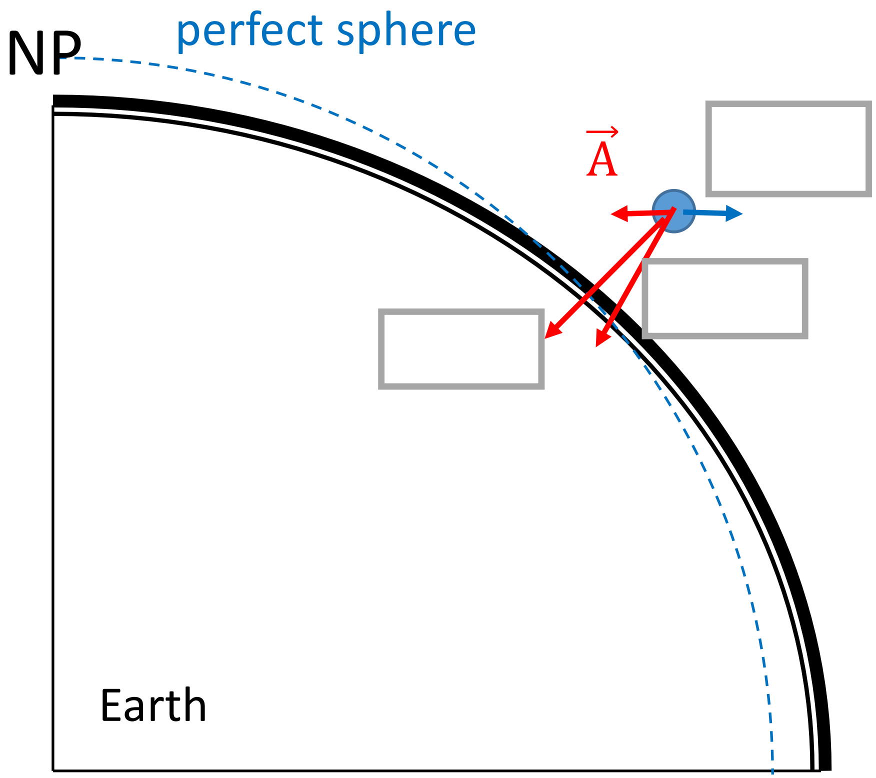
Geopotential and Hypsometric equation
(Ch. 1.3, Ch. 1.4.1)



(true, apparent) gravitational force vector is perpendicular to Earth's surface

It turns out to be useful to define a quantify whose gradient is the (true, apparent) gravitational force vector

Geopotential: a scalar whose gradient is the gravitational force

$\nabla\Phi =$ ☐

$\frac{\partial \Phi}{\partial z} =$ ☐

$d\Phi =$ ☐

$\Phi =$ ☐

Geopotential and Hypsometric equation
(Ch. 1.3, Ch. 1.4.1)

Geopotential height

$Z \equiv$ $\quad$ $g_0 = 9.80665\ m\ s^{-2}$ $\quad$ $Z \cong z$ in the troposphere and lower stratosphere

Hypsometric equation

$$\mathrm{d\Phi} = \mathrm{gdz} =$$

integrate vertically from p_1 (z_1) to p_2 (z_2)

$$\Phi(z_2) - \Phi(z_1) =$$

define layer-mean temperature

$$\langle T \rangle =$$

layer thickness

$$Z_T = Z_2 - Z_1 =$$

what determines the thickness of a layer bounded by isobaric surfaces ?

Vertical distribution of pressure
(Ch. 1.4.1)

Hypsometric equation (Ch 1.4.1)

thickness

$Z_T =$

define a scale height

$H \equiv$

re-write the hypsometric equation

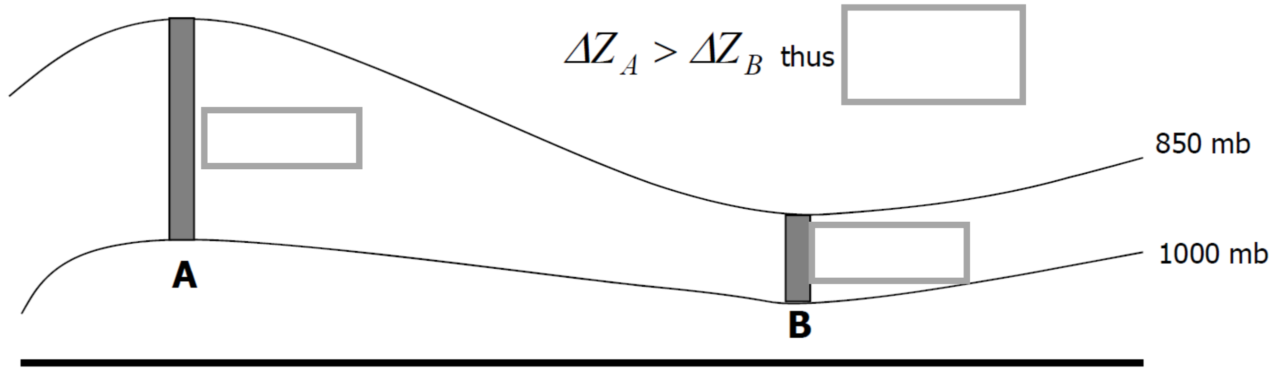
$Z_T =$

from surface (z=0, p_0: surface pressure) to an arbitrary height

$Z =$

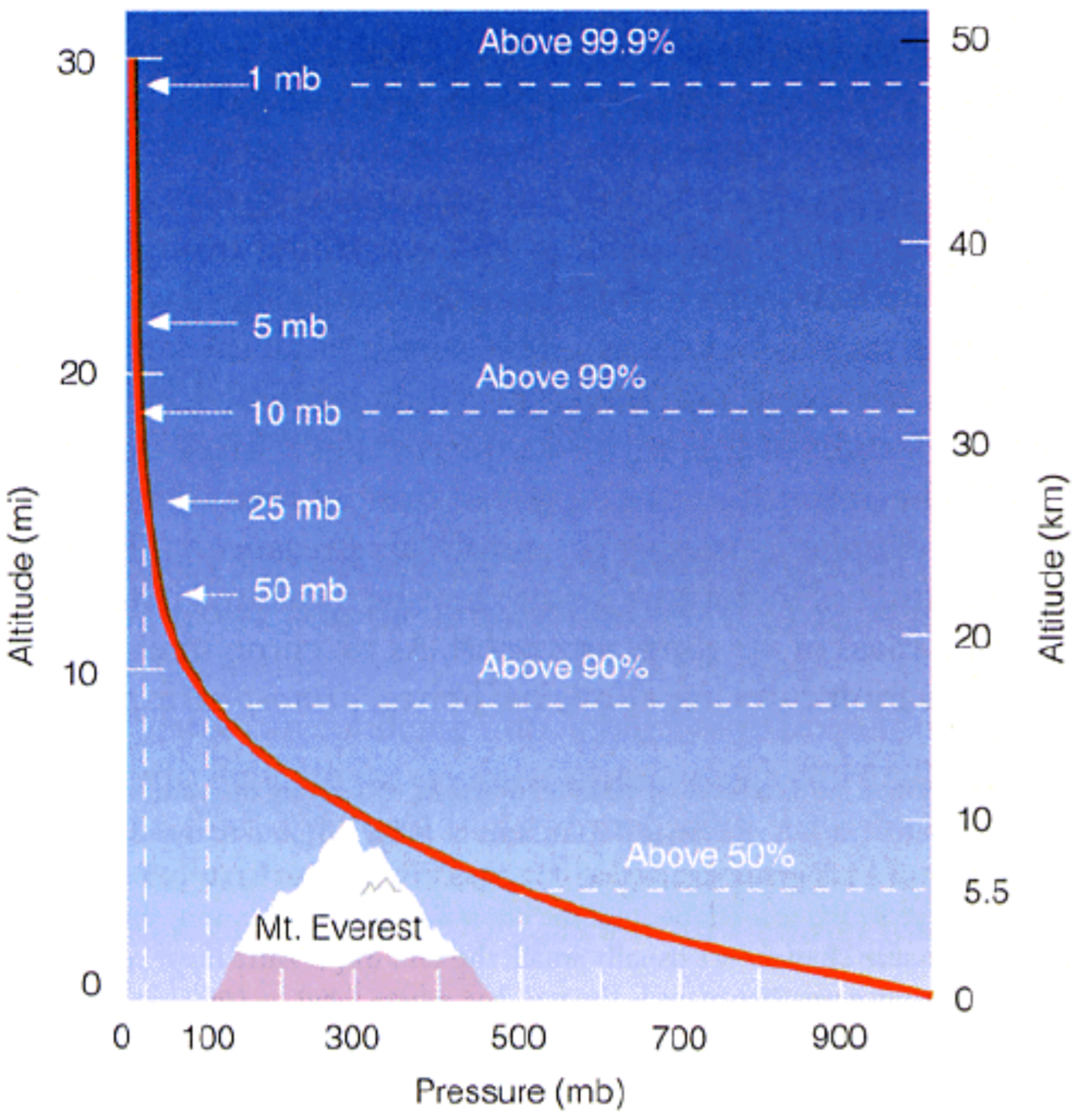
vertical distribution of pressure

$p(Z) =$



what determines the rate at which pressure drops with height?
is it worth changing vertical coordinate to pressure?
is it possible?

Vertical distribution of pressure
(Ch. 1.4.1)



(from Meteorology Today)

vertical distribution of pressure

$p(Z) =$ [ ]

$H \equiv$ [ ]