

Handy Constants

Thermodynamics

$$0^\circ\text{C} = 273\text{K}$$

for air

$$R_a = 287 \text{ J}/(\text{kg K}), C_v = 718 \text{ J}/(\text{kg K}), C_p = 1005 \text{ J}/(\text{kg K})$$
$$H_\rho \simeq R_a T_0 / g \quad (\text{for isothermal atmosphere})$$

for water

$$\beta_T = 2.1 \times 10^{-4} \text{ K}^{-1}, \beta_S = 7.4 \times 10^{-4} \text{ ppt}^{-1}, \beta_p = 4.1 \times 10^{-10} \text{ Pa}^{-1}$$
$$H_\rho \simeq 200 \text{ km}, H_T \simeq 2000 \text{ km}$$

Density of dry air at 20°C and standard pressure

$$\rho_a = 1.29 \text{ kg}/\text{m}^3$$

Density of fresh water at 20°C and standard pressure

$$\rho_w = 998 \text{ kg}/\text{m}^3$$

Constants for the Earth

angular frequency

$$\Omega_e = 7.3 \times 10^{-5} \text{ s}^{-1}$$

f_0 at midlatitudes

$$f_0 = 10^{-4} \text{ s}^{-1}$$

β at equator

$$\beta = 2 \times 10^{-11} (\text{ms})^{-1}$$

standard pressure

$$P_0 = 101 \text{ kPa}$$

gravity

$$g = 9.81 \text{ m}/\text{s}^2$$

Earth's radius

$$R_e = 6.4 \times 10^6 \text{ m}$$

1° latitude is 111 km