Conversion from pressure to depth

$$p = -\rho_0 g z$$

$g = 10 \frac{m}{s^2}$

$\rho_0 = 1000 \frac{kg}{m^3}$

$1\ Pa = 1 \frac{N}{m^2} = 10 \frac{dynes}{cm^2}$

$1\ N = 1 \frac{kg\ m}{s^2}$

$1\ bar = 10^5 \frac{N}{m^2} = 10^6 \frac{dynes}{cm^2}$

$1\ mb = 100\ Pa = 1\ hPa$

The expasion coefficient for the equation of state were derived for pressure in bar.

Therefore,

$$-z = \frac{p}{\rho_0 g} = \frac{10^5 \frac{kg}{s^2 m}}{1000 \frac{kg}{m^3}\ 10 \frac{m}{s^2}} = 10\ p$$

If it is assumed that there is not pressure variation along geopotential, the pressure and depth are interchangeable

pressure (bars) = 0.1 depth (meters)

or

pressure (decibars) = depth (meters)