

Homework 1

1. The temperature at a point 50 km north of a station is 3°C cooler than at the station. If the wind is blowing from northeast at 20m/s and the air is being heated by radiation at the rate of 1°C per hour, what is the local temperature change at the station?
2. Draw the plot of the difference between the geopotential height and height.

Hint:

$$\text{geopotential: } \Phi(h) = \int_0^h g(z) dz,$$

$$\text{geopotential height: } Z_g(h) = \frac{\Phi(h)}{g_0},$$

$$g(z) = \frac{GM}{(z + R)^2}, \quad g_0 = \frac{GM}{R^2}$$