Solution 1.12

The variation of gravitational acceleration above the sea level is given as a function of altitude. The height at which the weight of a body will decrease by 0.3% is to be determined.

Analysis   The weight of a body at the elevation z can be expressed as

$$W = mg = m(9.807 - 3.32 \times 10^{-6} z)$$

In our case,

$$W = (1 - 0.3/100)W_s = 0.997W_s = 0.997mg_s = 0.997(m)(9.807)$$

Substituting,

$$0.997(9.807) = (9.807 - 3.32 \times 10^{-6} z) \longrightarrow z = \mathbf{8862 \ m}$$

z

0

Sea level