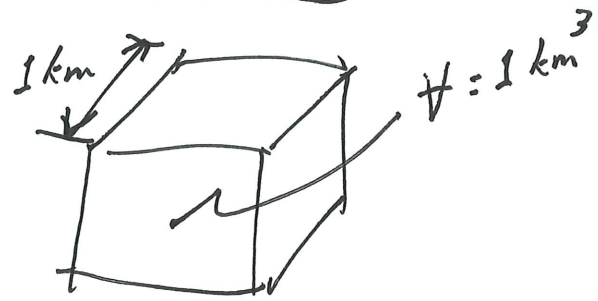


MYOH 1.24

GIVEN: Cloud volume = 1 km^3
Water (liquid) content = $0.28/\text{m}^3$

FIND: (a) Volume in mi^3
(b) Cloud weight in pounds

DIAGRAM



ASSUME: —

ANALYSIS:

(a) Conversion factor: $1 \text{ mile} = 1.609 \times 10^3 \text{ m}$
 $1 \text{ mile} = 1.609 \text{ km}$

So, $1 \text{ km} = 0.622 \text{ mi}$
 $(1 \text{ km})^3 = (0.622 \text{ mi})^3$

$V = 0.241 \text{ mi}^3 \leftarrow \text{ANS.}$

(b) First, get liquid water mass, then convert mass to weight.

$(0.28/\text{m}^3)(1000\text{m})^3 = 2 \times 10^8 \text{ g} = \underline{200,000 \text{ kg}}$

Let's do this for BG units and EE units

EE $1 \text{ lb}_m = 0.4536 \text{ kg}$ So, $\frac{200,000 \text{ kg}}{0.4536 \text{ kg}} = 440,920 \text{ lb}_m$

Note

$W = \frac{mg}{g_c}$

$W = \frac{(440,920 \text{ lb}_m)(32.17 \frac{\text{ft}}{\text{s}^2})}{(32.17 \frac{\text{lb}_m \cdot \text{ft}}{\text{lb}_f \cdot \text{s}^2})} = \underline{440,920 \text{ lb}_f} \leftarrow \text{ANS.}$

BG $1 \text{ kg} = 0.06852 \text{ slugs}$ so $(200,000 \text{ kg})(0.06852 \text{ slug/kg}) = 13,704 \text{ slugs}$
 $W = \frac{(13,704 \text{ slugs})(32.17 \frac{\text{ft}}{\text{s}^2})}{1 \frac{\text{slug} \cdot \text{ft}}{\text{lb} \cdot \text{s}^2}} = \underline{440,900 \text{ lb}} \leftarrow \text{ANS.}$

differ due to roundoff