

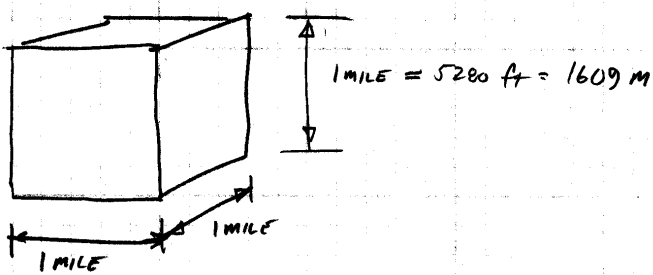
Staple	Name	Class/Section	Date	Page 2 of 5
	JOHN SMEATON	FRESHMAN CLINIC I SECTION 4	16 SEPT 2002	2/5
Problem Number	2-8 METEOROLOGISTS OFTEN REFER TO AIR MASSES IN FORECASTING THE WEATHER.			
Problem Statement	TO FIND: ESTIMATE OF MASS OF 1 MILE ³ OF AIR, IN SLUGS & Kg. MAKE YOUR OWN REASONABLE ASSUMPTIONS WITH RESPECT TO CONDITIONS IN THE ATMOSPHERE.			
Definition Sketch	SOLUTION: 			
Unit Conversions Shown	SIMPLEST APPROACH: ASSUME DENSITY OF AIR IS CONSTANT OVER THE 1 CUBIC MILE SEGMENT (NOT NECESSARILY A GOOD ASSUMPTION). IF SO, THEN $\rho_{AIR} = 1.22 \text{ kg/m}^3 = 0.00237 \text{ slugs/ft}^3$ AND $M_{AIR} = \rho \cdot V = (1.22 \frac{\text{kg}}{\text{m}^3}) (1609 \text{ m})^3 = 5.09 \times 10^9 \text{ kg}$ OR $(0.00237 \frac{\text{slugs}}{\text{ft}^3}) (5280 \text{ ft})^3 = 3.49 \times 10^8 \text{ SLUGS}$			
Box Around Answer	SO $M_{AIR} \approx 5.1 \times 10^9 \text{ kg}$ $\approx 3.5 \times 10^8 \text{ SLUGS}$ } ASSUMING CONSTANT DENSITY.			
Commentary	IN REALITY, DENSITY IS NOT CONSTANT (IT IS A FN OF TEMPERATURE & PRESSURE, WHICH VARY W/ ELEVATION IN THE ATMOSPHERE). TRUE MASS IS SOMEWHAT LESS			

Figure 1: Sample homework on engineering paper in proper format.