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SP3.1. The richest part of an oil shale seam is called the mahogany zone. If this zone is located 1000 ft below the surface, what is the gauge pressure in this zone in atmospheres? What is the absolute pressure?

Data: Assume earth density to have a specific gravity of 2.7, and that the pressure can be calculated from  $pgh$ . The oil shale seam is located near Vernal, Utah, with a surface atmospheric pressure of 0.83 atm. Please consider gauge pressure relative to the ambient pressure at ground level.

SP3.2

- a. What is  $91^{\circ}\text{F}$  in  $^{\circ}\text{R}$ ,  $^{\circ}\text{C}$ , and  $\text{K}$ ?
- b. Liquid  $\text{N}_2$  is at  $77\text{ K}$ . What is this temperature in  $^{\circ}\text{F}$ ,  $^{\circ}\text{R}$ , and  $^{\circ}\text{C}$ ?
- c. A gas is heated from  $120^{\circ}\text{F}$  to  $180^{\circ}\text{F}$ . What is the temperature change in  $^{\circ}\text{F}$ ,  $^{\circ}\text{R}$ , and  $^{\circ}\text{C}$ ?