1.36 A tire having a volume of 2.5 ft$^3$ contains air at a gage pressure of 30 psi and a temperature of 70 °F. Determine the density of the air and the weight of the air contained in the tire.

\[
\rho = \frac{p}{RT} = \frac{(30 \ \frac{lb}{in^2} + 14.7 \ \frac{lb}{in^2}) \ (144 \ \frac{in^2}{ft^2})}{(1716 \ \frac{ft^2 \ lb}{slug \ °R}) \ [(70 °F + 460 °R)]} = 7.08 \times 10^{-3} \ \frac{slugs}{ft^3}
\]

weight = \rho g \times volume = \left(7.08 \times 10^{-3} \ \frac{slugs}{ft^3}\right) \left(32.2 \ \frac{ft}{s^2}\right) \ (2.5 \ ft^3) = 0.570 \ lb