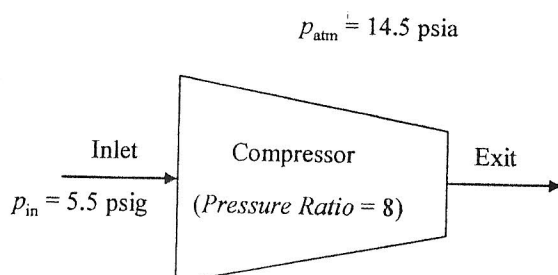


PROBLEM 1.40



From the compressor pressure ratio, the exit pressure ^{in psia} can be determined from

$$\text{pressure ratio} = p_{\text{exit}}/p_{\text{in}} \rightarrow p_{\text{exit}} = p_{\text{in}}(\text{pressure ratio})$$

Inlet pressure must be expressed as absolute pressure to solve for exit pressure. Conversion from the inlet pressure gage reading to absolute pressure is determined from in psia

$$p_{\text{in}}(\text{gage}) = p_{\text{in}}(\text{absolute}) - p_{\text{atm}}(\text{absolute})$$

Rearranging the equation to solve for $p_{\text{in}}(\text{absolute})$ and substituting values yield

$$p_{\text{in}}(\text{absolute}) = p_{\text{in}}(\text{gage}) + p_{\text{atm}}(\text{absolute}) = 5.5 \text{ psig} + 14.5 \text{ psia} = 20 \text{ psia}$$

Substituting absolute pressure at the inlet into the equation for exit pressure yields

$$p_{\text{exit}} = (20 \text{ psia})(8) = \underline{\underline{160 \text{ psia}}}$$