2.4

$$F = ma = \frac{0.5\,lbf}{32.17\ ft/sec^2} \times 5\ \frac{ft}{sec^2} = \underline{0.07771\,lbf}$$

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2.5

$$m = 200\,gm \times \frac{1\,kg}{1000\,gm} = .2\,kg$$

$$a = 25\ \frac{cm}{sec^2} \times \frac{1\,m}{100\,cm} = .25\ m/s^2$$

$$F = ma = .2\,kg \times .25\ \frac{m}{s^2} = .05\ \frac{kg \cdot m}{s^2} = .05\,N$$

$$F = .05\,N \times \frac{1\,lbf}{4.448\,N} = \underline{0.01124\,lbf}$$

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2.8

$$1\ \frac{cm^3}{s} = 1\ \frac{cm^3}{s} \times \left(\frac{1\,m}{100\,cm}\right)^3 \times \left(\frac{1\,gal}{3.785412 \times 10^{-3}\,m^3}\right) \times \frac{60\,s}{min}$$

$$= \underline{1.585032 \times 10^{-2}\ \frac{gal}{min}}$$

or

$$\underline{1\ \frac{gal}{min} = 63.0902\ \frac{cm^3}{s}}$$

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2.9

$$R = 1545\ \frac{ft - lbf}{lbm\ mole - {}^\circ R}$$

$$R = 1545\ \frac{ft - lbf}{lbm\ mole - {}^\circ R} \times 9.8066\ \frac{lbm/lbf}{kg - N} \times .3048\ \frac{m}{ft} \cdot \frac{{}^\circ K}{{}^\circ R}$$

$$\approx \underline{8313\ \frac{N \cdot m}{kg \cdot mole - {}^\circ K}}$$