# Chapter 15 Even Answers

**2.** $\sim 10^{18}\ \text{kg/m}^3$
**4.** $1.92 \times 10^4$ N
**6.** (a) $1.01 \times 10^7$ Pa (b) $7.09 \times 10^5$ N
**8.** 225 N
**10.** (a) 65.1 N (b) 275 N
**12.** $5.88 \times 10^6$ N, 196 kN, 588 kN
**14.** (a) 29.4 kN (to the right) (b) 16.3 kN·m (counterclockwise)
**16.** $0.986 \times 10^5$ Pa
**18.** (a) 20.0 cm (b) 0.490 cm
**20.** (a) 444 kg (b) 480 kg
**22.** $\dfrac{m}{(\rho_w - \rho_s)h}$
**24.** (a) $1.0179 \times 10^3$ N, $1.0297 \times 10^3$ N (b) 86.2 N (c) 11.8 N
**26.** $\sim 10^4$
**28.** 0.611 kg
**30.** $T = \left(\dfrac{2}{r}\right)\sqrt{\dfrac{\pi M}{\rho g}}$
**32.** $1.28 \times 10^4\ \text{m}^2$
**34.** 12.8 kg/s
**36.** (a) 1 atm + 15.0 MPa (b) 2.98 m/s (c) 4.45 kPa
**38.** (a) 28.0 m/s (b) 28.0 m/s (c) 2.11 MPa
**40.** $2.51 \times 10^{-3}\ \text{m}^3/\text{s}$
**42.** 347 m/s
**44.** 12.6 m/s
**46.** (a) $h_0/2$ (b) $h_0$
**48.** 2.25 m above level where water emerges
**50.** 455 kPa
**52.** 8.01 km, Yes
**54.** 0.604 m
**56.** $T_1 = (1 - \rho_0/\rho_{\text{Fe}})m_{\text{Fe}}g$ (top scale), $T_2 = [m_b + m_0 + (\rho_o/\rho_{\text{Fe}})m_{\text{Fe}}]g$ (bottom scale)
**58.** (b) $2.58 \times 10^4$ N
**60.** (a) $a = 0.461\ \text{m/s}^2$ = constant (b) 4.06 s
**62.** 758 Pa
**66.** (b) 1.40 s
**68.** (a) 3.307 g (b) 3.271 g (c) $3.48 \times 10^{-4}$ N