Assignment #7

HW # 7 6.3 p 460 # 4, 8, 12, 16, 20, 22, 26, 32, 34, 36

4. $R = \$5000 \quad i = 9\%, \quad n = 10$

$$S = \$5000 \cdot s_{\overline{10}|9\%} = 5000(15.192930)$$

$$= \$75,964.65$$

8. $R = \$2000, i = 12\%, n = 10$

$$S = \$2000 \cdot s_{\overline{10}|12\%} = 2000(17.548735)$$

$$= \$35,097.47$$

12. $S = \$50,000, n = (4)(14) = 56, i = \dfrac{0.12}{4} = 0.03$

$$50,000 = R \cdot \left[\frac{(1+0.03)^{56} - 1}{0.03}\right] = R(141.153768)$$

$$R = \frac{50,000}{141.153768} = \$354.22$$

16. A sinking fund is a savings plan, so the more often it is compounded the better. Therefore, the rate given in (a), namely, 12% compounded monthly, is better.

20. $R = 1500, n = 3 \cdot 12 = 36, \; i = \dfrac{0.12}{12} = 0.01$

$$S_{due} = 1500\left[\frac{(1+0.01)^{36} - 1}{0.01}\right](1+0.01)$$

$$= \$65,261.47$$

22. $R = 1800, n = 4, \; i = \dfrac{0.08}{4} = 0.02$

$$S_{due} = 1800\left[\frac{(1+0.02)^{4} - 1}{0.02}\right](1+0.02) = \$7567.27$$

26. $R = \$500, \; n = 16, \; i = 4\%$

$$S = \$500 \cdot s_{\overline{16}|4\%} = 500(21.24531) = \$10,912.27$$

32. $S = 75,000, \; n = 16, \; i = 0.06$

$$R = \frac{75,000}{s_{\overline{16}|6\%}} = 75,000 \cdot \frac{1}{s_{\overline{16}|6\%}}$$

$$= \frac{75,000}{25.6725} = \$2921.41$$

34. $S_{due} = 100,000, \; n = 12 \cdot 4 = 48,$

$$i = \frac{0.066}{12} = 0.0055$$

$$100,000 = R\left[\frac{(1+0.0055)^{48} - 1}{0.0055}\right](1+0.0055)$$

$$= R(55.062395)$$

$$R = \frac{100,000}{55.062395} = \$1816.12$$

36. For the first annuity: the number of periods is $n = (4)(8) = 32$, and the rate per period is $i = \dfrac{0.076}{4} = 0.019$

$$S_1 = \$1000 \cdot \left[\frac{(1+0.019)^{32} - 1}{0.019}\right] = \$1000(43.4898652) = \$43,489.87$$

For the next $18\frac{1}{2}$ years, the money is earning 7.6% interest compounded quarterly. There are $n = (4)(18.5) = 74$ periods, and the rate per period is still $i = \dfrac{0.076}{4} = 0.019$. So, after $8 + 18\frac{1}{2}$ years the investment is worth $S_1 = \$43,489.87(1+0.019)^{74} = \$175,096.61$. For the second annuity: the number of periods is $n = (4)\left(18\frac{1}{2}\right) = 74$, and the rate per period is $i = \dfrac{0.076}{4} = 0.019$.

$$S_2 = \$200\left[\frac{(1+0.019)^{74} - 1}{0.019}\right] = \$200(159.270889) = \$31,854.18$$

Therefore, at the end of $8 + 18\frac{1}{2}$ years, there is a total of $S = S_1 + S_2 = \$175,096.61 + \$31,854.18$

$$= \$206,950.79$$