3.3  a. quarter   b. semi-annual   c. month   d. week   e. n = infinite

3.6  \( i = \left(1 + \frac{r}{m}\right)^m - 1 \)
    
    a.  \( m = 1; \ r/m = r = 4\% \)
    b.  \( m = 2; \ r/m = r/2; \ r = 8\% \)
    c.  \( m = 4; \ r/m = r/4; \ r = 16\% \)

3.8  \( i = \left(1 + \frac{r}{m}\right)^m - 1; \ \ \ r = .12 \ \ m = 4; \ i = \left(1 + \frac{.12}{4}\right)^4 - 1 = .1255 \text{ or } 12.55\% \)

3.10  \( i = \left(1 + \frac{r}{m}\right)^m - 1; \ i = .12; \ m = 4; \ r = ? \)

    \( .12 = \left(1 + \frac{r}{4}\right)^4 - 1; \ (1 + \frac{r}{4})^4 = \sqrt[4]{1.12} = 1.0287; \ r = (1.0287 - 1)4 = .11495 \text{ or } 11.495\% \)

3.17  \( PP = CP; \ PP = \text{month}; CP = \text{month}; i = r = 2\%/\text{mo}; n = 3\text{yrs x 12mo} = 36 \)

\( P_0 = ? = 190K(P/F,2\%,36) = 93,138 \)

\[ .4902 \]

\[ 0 \]
\[ 1\text{yr} \]
\[ 12\text{mo} \]
\[ 2\text{yr} \]
\[ 24\text{mo} \]
\[ 36\text{mo} \]

\[ \$192K \]
3.20

\[ F_5 = ? = \$192K \left( \frac{F}{P}, 1.5\%, 60 \right) = \$469,094 \]

\[ P_0 = \$192k \]

3.27

PP > CP  \hspace{1cm} PP = 5; \hspace{1cm} CP = 12; \hspace{1cm} m = 6

Semi-annual > month  \hspace{1cm} i = 1\%/mo or 6\%/semi-annual

\[ i_{eff} = (1 + \frac{0.06}{6})^6 - 1 = 0.06152 \text{ or } 6.152\% \]

EXCEL

\[ P_0 = ? = \$13K \left( \frac{P}{A}, 6.152, 5 \right) = \$54,535 \]

\[ \text{or } = 13K \left[ \left( 1 + 0.06152 \right)^6 - 1 \right] / 0.06152 \left( 1 + 0.06152 \right)^6 = \$54,535 \]

3.30

PP = month \hspace{1cm} CP = month; \hspace{1cm} PP = CP; \hspace{1cm} i = 12\%/yr or 1\%/mo

\[ PV_{\text{treatment}} = PV_{\text{earnings}} \]

\[ A = ? = \]

\[ \$10K = \$13K \left( \frac{P}{A}, 6.152, 5 \right) \]

\[ \text{or } = 13K \left[ \left( 1 + 0.06152 \right)^6 - 1 \right] / 0.06152 \left( 1 + 0.06152 \right)^6 = \$54,535 \]

\[ \$10K = A \left( \frac{P}{A}, 1\%, 12 \right) \left( \frac{P}{F}, 1\%, 12 \right); \hspace{1cm} A = \$2,821 \]

\[ \begin{array}{c|c|c}
11.2551 & 44.9550 & .8874 \\
\end{array} \]
3.50 PP = daily or 360/yr CP = monthly; PP < CP; since cash flows are negative move all daily pmts to end of month (becomes -$300/mo). Common practice is to assume 30 days/month and 360 days/year. i = 1% (12% CP monthly); n = 36 months.

\[ A = P(A/P,1\%,36) = [950 + 300(P/A,1\%,36)](A/P,1\%,36) = $332/mo \]

3.52 PP = month CP = semi-annual; PP < CP Since cash flows are negative move all monthly pmts to end of semi-annual period (becomes -$6000/6 mos). i = 5%(10% CP semi-annually); n = 20 semi-annual periods

\[ F_{20} = 6000(F/A,5\%,20) = $198,396 \]