5. (c) How many years for $10000 to grow to $1,000,000 if compounded quarterly?
Compounded quarterly at 10%\% year.

\[ r = 10\% = 0.10 \]
\[ n = 4 \]

\[ F = P \left( 1 + \frac{r}{n} \right)^{nt} \]
\[ 1,000,000 = 10000 \left( 1 + \frac{0.10}{4} \right)^{4t} \]
\[ 10000 = (1 + 0.025)^{4t} \]
\[ y_t \]
\[ 10000 = (1.025)^{4t} \]
\[ \ln 10000 = \ln \left( 1.025 \right)^{4t} \]
\[ 4t \ln 10 = 3 \ln 10 \]
\[ 4t = \frac{3 \ln 10}{\ln 1.025} \]
\[ t = \frac{3}{4} \cdot \frac{\ln 10}{\ln 1.025} \]

\[ t \approx 69.9 \text{ years} \]