Lesson 1: Simple Interest  \( I = Prt \)

1. Express the following rates as \( r \) in the simple interest formula.
   a) 5.5% ______  b) 20% ______

2. Express the following lengths of time as \( t \) in the simple interest formula.
   a) 3 months ______  b) 40 days ______

3. $600 is invested for 4 months at 6% simple interest. How much interest is earned?

4. An investment matured from $300 to $336. It was invested at a simple interest rate of 6%. How long was it invested for?

5. What rate of simple interest is needed for $500 to triple in 3 years?

Lesson 2/3: Compound Interest  \( A = P(1 + r)^n \) and \( PV = A(1 + r)^{-n} \)

6. Complete the missing values in the table.

<table>
<thead>
<tr>
<th>Annual rate</th>
<th>Time (years)</th>
<th>Compounding Period</th>
<th>Frequency (yearly)</th>
<th>n</th>
<th>Rate freq</th>
</tr>
</thead>
<tbody>
<tr>
<td>8%</td>
<td>5</td>
<td>Quarterly</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. Using the formula calculate the final amount of $3700 after 3 years 15% compounded semi-annually.

8. Using the formula calculate the present value of $2500 due in 3 years at 5% compounded monthly.

9. Al wants to invest some money, which investment do you think is better? Explain how you determined your answer.
   Investment A: 6% compounded semi-annually?
   Investment B: 4.5% compounded quarterly?
Lesson 4: Using the TVM Solver:

10. A) How long would it take an investment of $5000 to double at 5.5% compounded monthly?

\[
\begin{align*}
N &= \quad \\
I \% &= \\
PV &= \\
PMT &= \\
FV &= \\
P/Y &= \\
C/Y &= \\
PMT: \text{END BEGIN}
\end{align*}
\]

B) Would a $10000 investment double in value in the same length of time? Check.

\[
\begin{align*}
N &= \quad \\
I \% &= \\
PV &= \\
PMT &= \\
FV &= \\
P/Y &= \\
C/Y &= \\
PMT: \text{END BEGIN}
\end{align*}
\]

11. A) What interest rate, compounded quarterly, is needed for a $2000 investment to grow to $3000 after five years?

\[
\begin{align*}
N &= \quad \\
I \% &= \\
PV &= \\
PMT &= \\
FV &= \\
P/Y &= \\
C/Y &= \\
PMT: \text{END BEGIN}
\end{align*}
\]

B) Would the same interest rate double a $5000 investment after five years? Check.

\[
\begin{align*}
N &= \quad \\
I \% &= \\
PV &= \\
PMT &= \\
FV &= \\
P/Y &= \\
C/Y &= \\
PMT: \text{END BEGIN}
\end{align*}
\]
Lesson 5: Changing Conditions

12. How much money would you need to invest on your 18\textsuperscript{th} Birthday at 8\% per year, compounded semi-annually, to be a millionaire by the time you are 60 years old? 75 years old?

\[
\begin{array}{ll}
\text{N=} & \text{N=} \\
\text{I\%=} & \text{I\%=} \\
\text{PV=} & \text{PV=} \\
\text{PMT=} & \text{PMT=} \\
\text{FV=} & \text{FV=} \\
\text{P/Y=} & \text{P/Y=} \\
\text{C/Y=} & \text{C/Y=} \\
\text{PMT\:=\:NL\:BEGIN} & \text{PMT\:=\:NL\:BEGIN} \\
\end{array}
\]

13. Which will double faster: money invested at 8\% per year, compounded semi-annually, or at 7.5\% per year, compounded quarterly? (Hint: Use any investment amount - ex. $1000)

\[
\begin{array}{ll}
\text{N=} & \text{N=} \\
\text{I\%=} & \text{I\%=} \\
\text{PV=} & \text{PV=} \\
\text{PMT=} & \text{PMT=} \\
\text{FV=} & \text{FV=} \\
\text{P/Y=} & \text{P/Y=} \\
\text{C/Y=} & \text{C/Y=} \\
\text{PMT\:=\:NL\:BEGIN} & \text{PMT\:=\:NL\:BEGIN} \\
\end{array}
\]

14. Renee has $3400 to invest for three years at 6\% per year. She is wondering how much the compounding periods affects the amount. Investigate what happens to Renee’s investment for compounding periods that are compounded: Annually, Quarterly and Monthly

\[
\begin{array}{llll}
\text{N=} & \text{N=} & \text{N=} \\
\text{I\%=} & \text{I\%=} & \text{I\%=} \\
\text{PV=} & \text{PV=} & \text{PV=} \\
\text{PMT=} & \text{PMT=} & \text{PMT=} \\
\text{FV=} & \text{FV=} & \text{FV=} \\
\text{P/Y=} & \text{P/Y=} & \text{P/Y=} \\
\text{C/Y=} & \text{C/Y=} & \text{C/Y=} \\
\text{PMT\:=\:NL\:BEGIN} & \text{PMT\:=\:NL\:BEGIN} & \text{PMT\:=\:NL\:BEGIN} \\
\end{array}
\]