1. (35 p) Find the equivalent equal payment series (A) such that the two cash flow transactions shown below are equivalent at **10% interest compounded annually**.

![Cash Flow Diagram](image1)

2. (35 p) In attempting to obtain a swing loan from a local bank, a general contractor was asked to provide an estimate of annual expenses. One component of the expenses is shown in the cash flow diagram below. Convert the amounts shown into an equivalent uniform annual amount in years 1 through 8, using an interest rate of **12% compounded annually**.

![Cash Flow Diagram](image2)

3. (30 p) Determine the value in year 8 that is equivalent to the cash flows below. Use an interest rate of **14% compounded annually**.

![Cash Flow Diagram](image3)
1)  
**Given:**  
\( CF_1 \equiv CF_2 \)  
**Find:** \( A \)  
Select reference point at \( n = 0 \)  
\[
(P_0)_{CF_1} = \$100\left( \frac{F}{P/A,10\%},4 \right) + $50\left( \frac{F}{P/A,10\%},1 \right) - $50
\]
\[
(P_0)_{CF_1} = \$100(3.1699)(0.9091) + $50(4.3781)(0.9091) - $50 = \$437.18
\]

\[
(P_0)_{CF_1} = \$437.18
\]
\[
(P_0)_{CF_2} = A + A\left( \frac{F}{P/A,10\%},5 \right)
\]
\[
(P_0)_{CF_1} = (P_0)_{CF_2}
\]
\[
$437.18 = A + A\left( \frac{F}{P/A,10\%},5 \right) \rightarrow A = \$91.26
\]
(Factors taken from Table / p.885)

2)  
**Given:**  
**Cash Flow (CF)**  
**Find:** \( A_{\text{equivalent}} \)  
Select reference point at \( n = 0 \)  
\[
(P_0)_{CF} = $5000 + $5000\left( \frac{F}{P/A,12\%},3 \right) + $3000\left( \frac{F}{P/A,12\%},3 \right) + $1000\left( \frac{F}{P/A,12\%},2 \right)\left( \frac{F}{P/F,12\%},6 \right)
\]
\[
(P_0)_{CF} = $5000 + $5000(2.4018) + $3000(2.4018)(0.7118) + $1000(1.6901)(0.5066)
\]
\[
(P_0)_{CF} = \$22994.01
\]
\[
A_{\text{equivalent}} = (P_0)_{CF}\left( \frac{A}{P},12\%,8 \right) = \$22994.01(0.2013) = \$4628.69
\]
(Factors taken from Table / p.887)

3)  
**Given:**  
**Cash Flow (CF)**  
**Find:** \( F \)  
Reference point at \( n = 8 \)  
\[
F = $2500\left( \frac{F}{P/A,14\%},8 \right)\left( \frac{F}{P},14\%,1 \right) - $1000\left( \frac{F}{P/A,14\%},3 \right)\left( \frac{F}{P},14\%,2 \right)
\]
\[
F = $2500(13.2328)(1.1400) - $1000(3.4396)(1.2996)
\]
\[
F = $33243.38
\]
(Factors taken from Table / p.889)