Q1: An ordinary annuity earns 7.44% compounded monthly. Answer questions A & B, which refer to one person's investment. Answer B depends on A.

A. A person decides to deposit $100 each month for 30 years. How much is in the account after 30 yrs?

Formula: \( FV = \frac{F}{I} \)

\[
\begin{align*}
F &= 133,136.999 \\
S &= 100 \\
I &= 0.0744/12 = 0.0062 \\
N &= 30 \times 12 = 360 \\
\text{Answer:} &\quad \$133,136.00
\end{align*}
\]

B. After 30 years, the person decides to make equal monthly withdrawals from the account for the next 15 years, reducing the balance to 0. What are the monthly withdrawals?

Formula: \( PV = \frac{S}{I} \)

\[
\begin{align*}
S &= 1,229.66 \\
I &= 0.0062 \\
N &= 15 \times 12 = 180 \\
\text{Answer:} &\quad \$1,229.66
\end{align*}
\]

Q2: A second person decides to deposit $100 each month into an ordinary annuity at an unknown nominal rate. After 30 years this person decides to make equal monthly withdrawals of $1350 from the annuity for 15 years, after which the balance is zero. Over the 45 year period, how much interest does the account earn?

\[
\begin{align*}
\text{Deposits} &= 100 \times 360 = 36,000 \\
\text{Withdrawals} &= 1350 \times 180 = 243,000 \\
\text{Withdrawals} - \text{Deposits} &= \frac{\text{Withdrawals}}{\text{Deposits}} \\
243,000 - 36,000 &= 180,000
\end{align*}
\]

Q3: A couple takes out a $120,000 mortgage at 7.2% compounded monthly and amortized over 15 years. Their monthly payment is $1092.06.

A. Fill in the first two rows of the amortization table:

<table>
<thead>
<tr>
<th>Pay #</th>
<th>Payment</th>
<th>Interest</th>
<th>Reduction in unpaid bal.</th>
<th>Unpaid balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>120,000</td>
</tr>
<tr>
<td>1</td>
<td>1092.06</td>
<td>72.0</td>
<td>372.06</td>
<td>119,627.94</td>
</tr>
</tbody>
</table>

\[
\begin{align*}
\text{Unpaid balance} &= 120,000 - (1092.06 \times 2) = 120,000 - 372.06 \\
&= 119,627.94
\end{align*}
\]

B. What is the unpaid balance after 10 years of payments? Indicate how you found the answer.

Setting \( N = 60 \), because 60 payments are left, we find \( PV = \$54,889.07 \).
Q1: An ordinary annuity earns 8.4% compounded monthly. Answer questions A & B, which refer to one person's investment. Answer B depends on A.

A. A person decides to deposit $100 each month for 30 years. How much is in the account after 30 yrs?

<table>
<thead>
<tr>
<th>Formula: $FV$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$F = 161,713.755$</td>
</tr>
<tr>
<td>$S = 100$</td>
</tr>
<tr>
<td>$t = .084/12 = .007$</td>
</tr>
<tr>
<td>$N = 30 \times 12 = 360$</td>
</tr>
<tr>
<td>Answer: $161,713.76$</td>
</tr>
</tbody>
</table>

B. After 30 years, the person decides to make equal monthly withdrawals from the account for the next 15 years, reducing the balance to 0. What are the monthly withdrawals?

<table>
<thead>
<tr>
<th>Formula: $PV$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P = 161,713.76$</td>
</tr>
<tr>
<td>$S = 1582.994$</td>
</tr>
<tr>
<td>$t = .084/12 = .007$</td>
</tr>
<tr>
<td>$N = 15 \times 12 = 180$</td>
</tr>
<tr>
<td>Answer: $1582.99$</td>
</tr>
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</table>

Q2: A second person decides to deposit $100 each month for 30 years into an ordinary annuity at an unknown nominal rate. After 30 years, this person decides to make equal monthly withdrawals of $1250 from the annuity for 15 years, after which the balance is zero. Over the 45 year period, how much interest does the account earn?

$$\text{Interest} = \text{Withdrawals} - \text{Deposits}$$

$$= (1250)(180) - (100)(360)$$

$$= 2,250,000 - 36,000$$

$$= \$\,189,000$$

Q3: A couple takes out a $100,000 mortgage at 7.2% compounded monthly and amortized over 15 years. Their monthly payment is $910.05

A. Fill in the first two rows of the amortization table:

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<tbody>
<tr>
<td>0</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>100,000</td>
</tr>
<tr>
<td>1</td>
<td>910.05</td>
<td>600</td>
<td>310.05</td>
<td>99,689.95</td>
</tr>
</tbody>
</table>

B. What is the unpaid balance after 10 years of payments? Indicate how you found the answer.

After 10 years, 60 payments are left (180 - 120)

$$\text{Accept } 45,740.89 \quad (\text{if } S = 910.05\text{ exactly})$$
Q1: An ordinary annuity earns 7.44% compounded monthly. Answer questions A & B, which refer to one person's investment. Answer B depends on A.

A. A person decides to deposit $100 each month for 30 years. How much is in the account after 30 yrs?

Formula: ________

Answer: ________

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<tr>
<td>1</td>
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B. What is the unpaid balance after 10 years of payments. Indicate how you found the answer.
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Formula: 

Answer: 

B. After 30 years, the person decides to make equal monthly withdrawals from the account for the next 15 years, reducing the balance to 0. What are the monthly withdrawals?

Formula: 

Answer: 

Q2: A second person decides to deposit $100 each month for 30 years into an ordinary annuity at an unknown nominal rate. After 30 years, this person decides to make equal monthly withdrawals of $1250 from the annuity for 15 years, after which the balance is zero. Over the 45 year period, how much interest does the account earn?

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B. What is the unpaid balance after 10 years of payments. Indicate how you found the answer.