EXAM FM QUESTIONS OF THE WEEK

S. Broverman, 2008

Week of January 28/08

A loan of amount \$100,000 is amortized with 60 monthly payments of amount $\$K$ each, with the first payment occurring one month after the loan was made. The amount of principal paid in the t-th payment is denoted P_t for $t = 1, 2, ..., 60$. The loan interest rate is j per month for the first 30 months and k per month for the next 24 months.

You are given the following:

- $P_{t+1} = 1.005P_t$ for $t = 1, 2, ..., 35$
- $P_{t+1} = 1.008P_t$ for $t = 37,\ 38, ..., 59$

Find the total amount of interest paid over the course of the loan..

The solution can be found below.

Week of January 28/08 - Solution

The given information implies that the interest rate j is .005 per month for the first 36 months and then $k = .008$ per month for the next 24 months. Therefore,

$100,000 = K \times [a_{\overline{36}|.005} + v^{36}_{.005} \times a_{\overline{24}|.008}]$.

Solving for K results in $K = 1,958.76$. The total paid in 5 years is
$60 \times 1,958.76 = 117,525.60$, of which 100,000 is principal.
The total amount of interest paid is 17,525.60 .