EXAM FM QUESTIONS OF THE WEEK

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Week of July 16/07

Smith makes deposits of 1000 each into a fund at times 0, 1 and 2 (measured in years).
The fund earns an annual effective interest rate of 8% in the first year (time 0 to time 1).
The fund earns an annual effective interest rate of 4% in the third year (time 2 to time 3).
It is also known that the fund earns an average annual effective rate of 5% over the three year period from time 0 to time 3. Find the annual effective rate of interest earned in the second year.

A) Less than .045   B) At least .045 but less than .046   C) At least .046 but less than .047
D) At least .047 but less than .048   E) At least .048

The solution can be found below.

Week of July 16/07 - Solution

With average annual effective rate of interest 5% for the three year period, Smith's accumulated value at time 3 is $1000[(1.05)^3 + (1.05)^2 + (1.05)] = 3310.13$.

Suppose the annual effective rate of interest in the second year is i.
Then Smith's accumulated fund at time 3 is

$$1000(1.08)(1+i)(1.04) + 1000(1+i)(1.04) + 1000(1.04) = 2163.20(1+i) + 1040.$$

This must be equal to 3310.13 , so that $2163.20(1+i) + 1040 = 3310.13$.
Solving for i results in $i = .04943$.