

EXAM FM QUESTIONS OF THE WEEK

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Week of April 10/06

Liabilities of \$10,000 each are due in 2 years and 4 years, and liabilities of \$20,000 each are due in 5 years and 8 years. Assets of amount \$A at due in 1 year and \$B due in 7 years have the same present value and Macaulay duration as the liabilities. Find A and B. Interest is at an annual effective rate of 10%.

The solution can be found below.

Week of April 10/06 - Solution

$$Av + Bv^7 = 10,000(v^2 + v^4) + 20,000(v^5 + v^8)$$

$$\rightarrow .909091A + .513158B = 36,843.$$

$$Av + 7Bv^7 = 10,000(2v^2 + 4v^4) + 20,000(5v^5 + 8v^8)$$

$$\rightarrow .909091A + 3.592107B = 180,583.$$

Subtracting the first equation from the second results in

$$3.078949B = 143,740, \text{ so that } B = 46,685.$$

$$\text{Then } A = \frac{36,843 - .513158(46,685)}{.909091} = 14,175.$$