

# EXAM M QUESTIONS OF THE WEEK

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## Week of September 25/06

A fully discrete whole life insurance policy with face amount  $f$  and premiums for life has the following expenses:

- level annual percentage of premium expense is  $Q\%$
- level annual per policy expense is  $\$C$
- settlement expense is  $\$K$

The expense-loaded premium based on the equivalence principle is  $G$ .

Of which of the variables  $f$ ,  $Q$ ,  $C$  and  $K$  is  $G$  a linear function?

**The solution can be found below.**

## **Week of September 25/06 - Solution**

$$G\ddot{a}_x = fA_x + .01QG\ddot{a}_x + C\ddot{a}_x + KA_x$$

Solving for  $G$  results in

$$G = \frac{(f+K)A_x + C\ddot{a}_x}{(1-.01Q)\ddot{a}_x} = f \cdot \frac{A_x}{(1-.01Q)\ddot{a}_x} + K \cdot \frac{A_x}{(1-.01Q)\ddot{a}_x} + C \cdot \frac{\ddot{a}_x}{(1-.01Q)\ddot{a}_x}$$

$G$  is a linear function of  $f$ ,  $K$ , and  $C$ , but not of  $Q$ .