

EXAM M QUESTIONS OF THE WEEK

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Week of March 20/06

Suppose that $0 < a < b < c$. An insurance on a loss of amount X makes the following payment:

$$.8 \times (X \wedge a) + .6 \times (X - b)_+ - .4(X - c)_+$$

Describe the piecewise definition of amount of insurance paid.

The solution can be found below.

Week of March 20/06 - Solution

$$X \wedge a = \begin{cases} X & X \leq a \\ a & X > a \end{cases}, \text{ this is insurance with a limit of } a$$

$$(X - b)_+ = \begin{cases} 0 & X \leq b \\ X - b & X > b \end{cases}, \text{ this is insurance with a deductible of } b$$

$$(X - c)_+ = \begin{cases} 0 & X \leq c \\ X - c & X > c \end{cases}, \text{ this is insurance with a deductible of } c$$

$$.8 \times (X \wedge a) = \begin{cases} .8X & X \leq a \\ .8a & X > a \end{cases},$$

$$.6 \times (X - b)_+ = \begin{cases} 0 & X \leq b \\ .6(X - b) & X > b \end{cases},$$

$$.4 \times (X - c)_+ = \begin{cases} 0 & X \leq c \\ .4(X - c) & X > c \end{cases}$$

Combining these insurance payments results is

$$\begin{aligned} &.8 \times (X \wedge a) + .6 \times (X - b)_+ - .4 \times (X - c)_+ \\ &= \begin{cases} .8X & X \leq a \\ .8a & a < X \leq b \\ .8a + .6(X - b) & b < X \leq c \\ .8a + .6(X - b) - .4(X - c) = .8a - .6b + .4c + .2X & X > c \end{cases} \end{aligned}$$