EXAM P QUESTIONS OF THE WEEK

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Week of October 29/07

The loss random variable X has the following pdf:
$$f(x) = \begin{cases} x - \frac{x^2}{2} & \text{if } 0 < x \leq 1 \\ \frac{x^2}{2} - x + 1 & \text{if } 1 < x < 2 \end{cases}, \text{ and 0 otherwise.}$$

When a loss occurs, an insurer pays the loss above a deductible of .5, up to a maximum insurance payment of 1.

Find the insurer's expected payment when a loss occurs.

A) .33   B) .48   C) .55   D) .67   E) .80

The solution can be found below.

Week of October 29/07 - Solution

The insurer's expected payment when a loss occurs is

$$\int_{.5}^{1.5}(x - .5)\,f(x)\,dx + \int_{1.5}^{2}1 \cdot f(x)\,dx$$

$$= \int_{.5}^{1}(x - .5)(x - \tfrac{x^2}{2})\,dx + \int_{1}^{1.5}(x - .5)(\tfrac{x^2}{2} - x + 1)\,dx + \int_{1.5}^{2}(\tfrac{x^2}{2} - x + 1)\,dx$$

$$= \tfrac{23}{384} + \tfrac{79}{384} + \tfrac{19}{48} = .6615 \ .$$