

# EXAM P QUESTIONS OF THE WEEK

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## Week of February 13/06

A loss  $X$  is a random variable with the following density function:

$$f(x) = .0001, \quad 0 \leq x \leq 10,000.$$

An insurance policy will pay a part of the loss that occurs in the following way:

Loss Amount $x$	Insurance Payment
$x \leq 1000$	0
$1000 < x \leq 5000$	$x - 1000$
$x > 5000$	$4000 + .5(x - 5000)$

The coefficient of variation of a random variable  $Y$  is defined to be  $\frac{\sqrt{\text{Var}(Y)}}{E(Y)}$ .

Find the coefficient of variation of  $Y$  if  $Y$  is the amount of the insurance payment.

**The solution can be found below.**

### **Week of February 13/06 - Solution**

$$\begin{aligned} E(Y) &= \int_{1000}^{5000} (x - 1000)(.0001) dx + \int_{5000}^{10,000} [4000 + .5(x - 5000)](.0001) dx \\ &= 800 + 2625 = 3425 . \end{aligned}$$

$$\begin{aligned} E(Y^2) &= \int_{1000}^{5000} (x - 1000)^2 (.0001) dx + \int_{5000}^{10,000} [4000 + .5(x - 5000)]^2 (.0001) dx \\ &= \frac{6,400,000}{3} + \frac{42,125,000}{3} = 16,175,000 . \end{aligned}$$

$$Var(Y) = E(Y^2) - [E(Y)]^2 = 4,444,375 .$$

$$\text{Coefficient of variation is } \frac{\sqrt{4,444,375}}{3425} = .616 .$$