

# EXAM C QUESTIONS OF THE WEEK

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## Week of February 25/08

From a random sample of loss amount from the distribution of the random variable  $X$  you are given the following:

- empirical estimate of the mean of  $X$  is 420
- empirical estimate of the limited expected loss with a policy limit of  $a$  is 385
- empirical estimate of the expected cost per payment with ordinary deductible  $a$  is 84
- empirical estimate of the expected cost per loss with a franchise deductible of  $a$  is 222.5

Determine the value of  $a$ .

**The solution can be found below.**

## Week of February 25/08 - Solution

We are given:

$E(\widehat{X}) = 420$  , empirical estimate of the mean of  $X$

$E(\widehat{X} \wedge a) = 385$  , empirical estimate of the limited expected loss with a policy limit of  $a$

$E(\widehat{X} - a | \widehat{X} > a) = 84$  , empirical estimate of the expected cost per payment with ordinary deductible  $a$

$E[(\widehat{X} - a)_+] + a \cdot P(\widehat{X} > a) = 222.5$  , empirical estimate of the expected cost per loss with a franchise deductible of  $a$

We first find  $E[(\widehat{X} - a)_+] = E(\widehat{X}) - E(\widehat{X} \wedge a) = 420 - 385 = 35$  .

Then, from  $E(\widehat{X} - a | \widehat{X} > a) = \frac{E[(\widehat{X} - a)_+]}{P(\widehat{X} > a)}$  we get  $P(\widehat{X} > a) = \frac{35}{84}$  .

Finally, we have  $35 + \frac{35}{84} \cdot a = 222.5$  , from which we get  $a = 450$  .