

54. The automobile is worth 15, the deductible 1
Finding the expected payment for this insurance

Y : the claim payment made by the insurance company

$$\Pr(\text{partial damage}) = 0.04$$

$$\Pr(\text{total loss}) = 0.02$$

3 circumstances

① loss of total car prob = 0.02

$$\text{total payment} = 15 - 1 = 14$$

② partial damage prob = 0.04

$X \sim$ density function

$$f(x) = \begin{cases} 0.5003e^{-x/2} & \text{for } 0 < x < 15 \\ 0 & \text{otherwise} \end{cases}$$

Total payment $\max(0, X-1)$

③ no loss or damage

$$\text{prob} = 1 - 0.04 - 0.02 = 0.94$$

$$\text{total payment} = 0$$

$$Y = \begin{cases} 14 & \text{prob} = 0.02 \\ \max(0, X-1) & \text{prob} = 0.04 \\ 0 & \text{prob} = 0.94 \end{cases}$$

$$E(Y) = \sum Y_i \Pr(Y_i)$$

$$\begin{aligned} E(Y) &= (0.94)(0) + (0.02)(14) + (0.04) \left(\int_0^{15} 0.5003(x-1)e^{-x/2} dx \right) \\ &= 0.28 + 0.020012 \left[-30e^{-7.5} + 2e^{-0.5} + \int_1^{15} e^{-x/2} dx \right] \\ &= 0.28 + 0.020012(2.408) \\ &= 0.328 \end{aligned}$$

for payment, multiply by 1000 $0.328 \times 1000 = 328$ B