

65. Solution: B

Let  $X$  and  $Y$  denote repair cost and insurance payment, respectively, in the event the auto is damaged. Then

$$Y = \begin{cases} 0 & \text{if } x \leq 250 \\ x - 250 & \text{if } x > 250 \end{cases}$$

and

$$E[Y] = \int_{250}^{1500} \frac{1}{1500} (x - 250) dx = \frac{1}{3000} (x - 250)^2 \Big|_{250}^{1500} = \frac{1250^2}{3000} = 521$$

$$E[Y^2] = \int_{250}^{1500} \frac{1}{1500} (x - 250)^2 dx = \frac{1}{4500} (x - 250)^3 \Big|_{250}^{1500} = \frac{1250^3}{4500} = 434,028$$

$$\text{Var}[Y] = E[Y^2] - \{E[Y]\}^2 = 434,028 - (521)^2$$

$$\sqrt{\text{Var}[Y]} = 403$$