

51. Solution: C

Let Y denote the manufacturer's retained annual losses.

$$\text{Then } Y = \begin{cases} x & \text{for } 0.6 < x \leq 2 \\ 2 & \text{for } x > 2 \end{cases}$$

$$\begin{aligned} \text{and } E[Y] &= \int_{0.6}^2 x \left[\frac{2.5(0.6)^{2.5}}{x^{3.5}} \right] dx + \int_2^{\infty} 2 \left[\frac{2.5(0.6)^{2.5}}{x^{3.5}} \right] dx = \int_{0.6}^2 \frac{2.5(0.6)^{2.5}}{x^{2.5}} dx - \frac{2(0.6)^{2.5}}{x^{2.5}} \Big|_2^{\infty} \\ &= -\frac{2.5(0.6)^{2.5}}{1.5x^{1.5}} \Big|_{0.6}^2 + \frac{2(0.6)^{2.5}}{(2)^{2.5}} = -\frac{2.5(0.6)^{2.5}}{1.5(2)^{1.5}} + \frac{2.5(0.6)^{2.5}}{1.5(0.6)^{1.5}} + \frac{(0.6)^{2.5}}{2^{1.5}} = 0.9343 . \end{aligned}$$