

145. New dental and medical plan options will be offered to state employees next year. An actuary uses the following density function to model the joint distribution of the proportion  $X$  of state employees who will choose Dental Option 1 and the proportion  $Y$  who will choose Medical Option 1 under the new plan options:

$$f(x, y) = \begin{cases} 0.50, & \text{for } 0 < x < 0.5 \text{ and } 0 < y < 0.5 \\ 1.25, & \text{for } 0 < x < 0.5 \text{ and } 0.5 < y < 1 \\ 1.50, & \text{for } 0.5 < x < 1 \text{ and } 0 < y < 0.5 \\ 0.75, & \text{for } 0.5 < x < 1 \text{ and } 0.5 < y < 1 \end{cases}$$

Calculate  $\text{Var}(Y | X = 0.75)$ .

- (A) 0.000
- (B) 0.061
- (C) 0.076
- (D) 0.083
- (E) 0.141