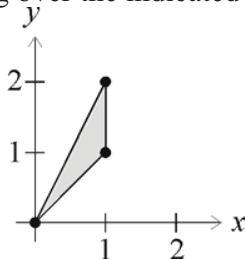


105. Solution: A

The calculation requires integrating over the indicated region.



$$E(X) = \int_0^1 \int_x^{2x} \frac{8}{3} x^2 y \, dy \, dx = \int_0^1 \frac{4}{3} x^2 y^2 \Big|_x^{2x} \, dx = \int_0^1 \frac{4}{3} x^2 (4x^2 - x^2) \, dx = \int_0^1 4x^4 \, dx = \frac{4}{5} x^5 \Big|_0^1 = \frac{4}{5}$$

$$E(Y) = \int_0^1 \int_x^{2x} \frac{8}{3} xy^2 \, dy \, dx = \int_0^1 \frac{8}{9} xy^3 \Big|_x^{2x} \, dx = \int_0^1 \frac{8}{9} x(8x^3 - x^3) \, dx = \int_0^1 \frac{56}{9} x^4 \, dx = \frac{56}{45} x^5 \Big|_0^1 = \frac{56}{45}$$

$$E(XY) = \int_0^1 \int_x^{2x} \frac{8}{3} x^2 y^2 \, dy \, dx = \int_0^1 \frac{8}{9} x^2 y^3 \Big|_x^{2x} \, dx = \int_0^1 \frac{8}{9} x^2 (8x^3 - x^3) \, dx = \int_0^1 \frac{56}{9} x^5 \, dx = \frac{56}{54} = \frac{28}{27}$$

$$\text{Cov}(X, Y) = E(XY) - E(X)E(Y) = \frac{28}{27} - \left(\frac{56}{45}\right)\left(\frac{4}{5}\right) = 0.04$$