

219. For a portfolio of policies, you are given:

- (i) The annual claim amount on a policy has probability density function:

$$f(x|\theta) = \frac{2x}{\theta^2}, \quad 0 < x < \theta$$

- (ii) The prior distribution of θ has density function:

$$\pi(\theta) = 4\theta^3, \quad 0 < \theta < 1$$

- (iii) A randomly selected policy had claim amount 0.1 in Year 1.

Determine the Bühlmann credibility estimate of the claim amount for the selected policy in Year 2.

- (A) 0.43
(B) 0.45
(C) 0.50
(D) 0.53
(E) 0.56