187. You are given:

(i) The annual number of claims on a given policy has a geometric distribution with parameter β.

(ii) The prior distribution of β has the Pareto density function

$$\pi(\beta) = \frac{\alpha}{(\beta+1)^{(\alpha+1)}}, \qquad 0 < \beta < \infty \ ,$$

where α is a known constant greater than 2.

A randomly selected policy had x claims in Year 1.

Determine the Bühlmann credibility estimate of the number of claims for the selected policy in Year 2.

(A) $\dfrac{1}{\alpha-1}$

(B) $\dfrac{(\alpha-1)x}{\alpha} + \dfrac{1}{\alpha(\alpha-1)}$

(C) x

(D) $\dfrac{x+1}{\alpha}$

(E) $\dfrac{x+1}{\alpha-1}$