

5.

You are given:

- (i) The annual number of claims for a policyholder has a binomial distribution with probability function:

$$p(x|q) = \binom{2}{x} q^x (1-q)^{2-x}, \quad x = 0, 1, 2$$

- (ii) The prior distribution is:

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

This policyholder had one claim in each of Years 1 and 2.

Determine the Bayesian estimate of the number of claims in Year 3.

- (A) Less than 1.1
- (B) At least 1.1, but less than 1.3
- (C) At least 1.3, but less than 1.5
- (D) At least 1.5, but less than 1.7
- (E) At least 1.7