

Question #242

Key: B

$\pi(q | 2, 2) \propto f(2 | q)f(2 | q)\pi(q) = q(q)(q^2 / 0.039) \propto q^4$. Because $\int_{0.2}^{0.5} q^4 dq = 0.006186$,

$\pi(q | 2, 2) = q^4 / 0.006186$. Given q , the expected number of claims is

$E(N | q) = 0(0.1) + 1(0.9 - q) + 2q = 0.9 + q$. The Bayesian estimate is

$$E(N | 2, 2) = \int_{0.2}^{0.5} (0.9 + q) \frac{q^4}{0.006186} dq = 1.319.$$