Question #142
Answer: B

In general $\operatorname{Var}(L) = \left(1+\frac{P}{\delta}\right)^2 \left({}^2\bar{A}_x - \bar{A}_x^2\right)$

Here $\bar{P}(\bar{A}_x) = \dfrac{1}{\bar{a}_x} - \delta = \dfrac{1}{5} - .08 = .12$

So $\operatorname{Var}(L) = \left(1+\dfrac{.12}{.08}\right)^2 \left({}^2\bar{A}_x - \bar{A}_x^2\right) = .5625$

and $\operatorname{Var}(L^*) = \left(1+\dfrac{\frac{5}{4}(.12)}{.08}\right)^2 \left({}^2\bar{A}_x - \bar{A}_x^2\right)$

So $\operatorname{Var}(L^*) = \dfrac{\left(1+\frac{15}{8}\right)^2}{\left(1+\frac{12}{8}\right)^2}(0.5625) = .744$

$\mathrm{E}[L^*] = \bar{A}_x - .15\bar{a}_x = 1 - \bar{a}_x(\delta + .15) = 1 - 5(.23) = -.15$

$\mathrm{E}[L^*] + \sqrt{\operatorname{Var}(L^*)} = .7125$