

127. Solution: D

Because the number of payouts (including payouts of zero when the loss is below the deductible) is large, we can apply the central limit theorem and assume the total payout S is normal. For one loss there is no payout with probability 0.25 and otherwise the payout is $U(0, 15000)$. So,

$$E[X] = 0.25 * 0 + 0.75 * 7500 = 5625,$$

$$E[X^2] = 0.25 * 0 + 0.75 * \left(7500^2 + \frac{15000^2}{12}\right) = 56,250,000, \text{ so the variance of one claim is}$$

$$\text{Var}(X) = E[X^2] - E[X]^2 = 24,609,375.$$

Applying the CLT,

$$P[1,000,000 < S < 1,200,000] = P\left[-1.781741613 < \frac{S - (200)(5625)}{\sqrt{(200)(24,609,375)}} < 1.069044968\right]$$

which interpolates to $0.8575 - (1 - 0.9626) = 0.8201$ from the provided table.