

**Question #205****Key: D**

State#	Number	Probability of needing Therapy	Mean Number of visits E(X)	E(N)	Var(N)	Var(X)	E(S)	Var(S)
1	400	0.2	2	80	64	6	160	736
2	300	0.5	15	150	75	240	2,250	52,875
3	200	0.3	9	60	42	90	540	8,802
							2,950	62,413

$$\text{Std Dev } (S) = \sqrt{62413} = 250$$

$$\Pr(S > 3000) = \Pr\left(\frac{S - 2950}{250} > \frac{50}{250}\right) = 1 - \Phi(0.2) = 0.42$$

The  $\text{Var}(X)$  column came from the formulas for mean and variance of a geometric distribution.

Using the continuity correction, solving for  $\Pr(S > 3000.5)$ , is theoretically better but does not affect the rounded answer.