$p = \frac{141}{347} = 0.40$

Geometric / Negative Binomial $(r=1)$

Failure = miss

$S = \{$ number of shots before a miss $\}$

$S \sim \text{Neg Bin}(p = 0.40, r=1)$

$$E(S) = \frac{p}{1-p} = \frac{0.40}{0.60} = 0.67.$$

$$P(S=5) = 0.4^5 \, 0.6 = 0.006.$$

$W = \{$ waiting time ~~for~~ until next shot $\}$ (in seconds)

$W \sim \text{Exponential}(\theta = 190)$

$$E(W_1 + W_2 + W_3 + W_4 + W_5 + W_6) = 6\,E(W)$$

$$= 6 \cdot 190 = 1140\,s = 19 \text{ min.}$$

later

$$\boxed{\begin{aligned} P(W > 5 \cdot 60) &= 1 - P(W \le 5 \times 60) \\ &= 1 - (1 - e^{-300/190}) \\ &= e^{-30/19} = 0.20 \end{aligned}}$$

$N = \{$ number of attempts in 10 min $\}$

$$N \sim \text{Poisson}\left(\lambda = \frac{10 \times 60}{190} = 3.16\right)$$

$E(N) = 3.16$

$$P(N \le 1) = P(N=0) + P(N=1)$$

$$= e^{-3.16} + e^{-3.16} \cdot 3.16 = 0.17.$$

$$P(X > x + y \mid X > y)$$

$$= \frac{P(X > x+y \cap X > y)}{P(X > y)}$$

$$= \frac{P(X > x+y)}{P(X > y)} = \frac{1 - (1 - e^{-x+y/\theta})}{1 - (1 - e^{-y/\theta})}$$

$$= \frac{e^{-x+y/\theta}}{e^{-y/\theta}} = e^{-x/\theta} = P(X > x)$$