

Solutions to HW 4

① Binomial $P(X=50) = \binom{50}{50} 0.98^{50} \cdot 0.02^0 \approx 0.364$
 $n=50$
 $x=50$
 $\text{OR } \text{binompdf}(50, 0.98, 50)$

② $P(X > 6) = 1 - P(X \leq 6) = 1 - \text{binomcdf}(30, 0.20, 6)$

③ $P(X=7) = \text{binompdf}(30, 0.20, 7)$
 $\binom{30}{7} 0.20^7 \times 0.80^{23}$

④ Poisson ($\lambda = 3$ outages/month)

$$\begin{aligned} P(X \geq 7) &= 1 - P(X \leq 6) \\ &= 1 - \text{poissoncdf}(\lambda t, x) \\ &= 1 - \text{poissoncdf}(3(4), 6) \\ &= 0.954 \end{aligned}$$

⑧ $\lambda = 2$ $P(X \geq 5) = 1 - P(X \leq 4)$
 $= 1 - \text{poissoncdf}(2(3), 4)$
 $= 0.715$

⑨ $\lambda = 2$ $P(X > 5) = 1 - P(X \leq 5)$
 $= 1 - \text{poissoncdf}(6, 5)$
 $=$

⑫ $P(X > 6)$ until 1st defect \Rightarrow Geometric
 $p = 0.05$
 $= 1 - \text{geometcdf}(0.05, 6)$

$$= 1 - P(X \leq 6) = 1 - 0.264 = 0.736$$

(13) $p = 0.10$
 $P(X < 6) = P(X \leq 5) = \text{geomcdf}(0.10, 5)$
 $= 0.40951$
 $= 0.410$

(14) Exp. Value $\Rightarrow \mu = np = (50)(0.98) = 49$

(15) $\mu = \frac{1}{p} = \frac{1}{0.05} = 20$

(16) Independence $\left. \begin{array}{l} n = 50 \text{ trials} \\ \text{King, no King} \\ X = ? \end{array} \right\} \text{Binomial}$

(17) $n = 30$
 $X = \text{number of}$
indep.