Solutions to HW 4

① Binomial $P(X=50) = \binom{50}{50} 0.98^{50} \cdot 0.02^{0} \approx 0.364$

$n = 50$
$x = 50$

6R binompdf(50, 0.98, 50)
n p x

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

③ $P(X=7) = \text{binompdf}(30, 0.20, 7)$

$\binom{30}{7} 0.20^{7} \times 0.80^{23}$

⑦ Poisson ($\lambda = 3$ outages/month)

$P(X \geq 7) = 1 - P(X \leq 6)$

$= 1 - \text{poissoncdf}(\lambda t, x)$

$= 1 - \text{poissoncdf}(3(4), 6)$

$= 0.954$

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 ⇒ Geometric

$p = 0.05$

$= 1 - \text{geometcdf}(0.05, 6)$

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

$= .736$

(13) $p = 0.10$

$P(X < 6) = P(X \leq 5) = \text{geometcdf}(.10, 5)$

$= 0.4095$

$= 0.410$

(14) Exp. Value $\Rightarrow \mu = np = (50)(.98) = 49$

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

(16) Independence $n = 50$ trials } Binomial

King, no King }

$x = ?$

(17) $n = 30$

$x =$ number $+$

indep.