10E #8b

$3(0.3)^3 = 3(0.027) = 0.081$

10F #2. $Y \sim Po(3)$

a) $P(Y=3) = \text{poissonpdf}(3, 3)$

$= 0.224$

b) $P(X<3) = P(X \leq 2)$

$= \text{poissoncdf}(3, 2)$

$= 0.423$

c) $P(X>3) = 1 - P(X \leq 3)$

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

$= 0.353$

d) $P(Y=4 \mid Y>3) = \dfrac{P(Y=4 \cap Y>3)}{P(Y>3)}$

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

$= 0.476$

10P #7c

$$\underbrace{5(0.45)^3(0.55)^4}_{\text{SMT}}$$

10H #2.

(a) X = number of flaws in 100 sq. meters

$X \sim Po(1)$

$P(X=2) = \text{poissonpdf}(1, 2)$

$= 0.184$

(b) Y = number of flaws in 25 sq. meters

$Y \sim Po(0.25)$

$P(Y \geq 1) = 1 - P(Y=0)$

$= 1 - \text{poissonpdf}(0.25, 0)$

10E #1 $X \sim B(8, 0.4)$

(d) $\mu = E(X) = np$

Binomial

$\mu = 8(0.4) = 3.2$

(e) $\sigma^2 = Var(X) = npq$

$\sigma^2 = 8(0.4)(0.6) =$

For the Poisson distribution

$\mu = E(X) = m$

$\sigma^2 = Var(X) = m$

10E 2(d) $Y \sim B(7, 0.3)$

Variance

$$\text{Var}(X) = E(X^2) - [E(X)]^2$$

10 H #4C

$$3.5 = E(X^2) - [3.5]^2$$

$$E(X^2) = 15.75$$

$$P(X=x) = \frac{e^{-m} m^x}{x!}$$

#5 $X \sim P_o(m)$ Find m.

$$P(X=0) + P(X=1) - P(X=4) = 0$$

$$\frac{e^{-m} \cdot m^0}{0!} + \frac{e^{-m} \cdot m}{1!} - \frac{e^{-m} \cdot m^4}{4!} = 0$$

$$e^{-m}\left(1 + m - \frac{m^4}{24}\right) = 0$$

Discrete Distributions

Ex.

x	0	1	2	3
$P(X=x)$	0.2	0.2	0.4	0.2

Find the mean and variance.

$$E(X) = \cancel{(0.2)(0)} + (0.2)(1) + (0.4)(2) + (0.2)(3)$$

$$= 1.6$$

$$E(X) = \sum x \cdot P(X=x)$$

$$\text{Var}(X) = E(X^2) - [E(X)]^2$$

$$E(X^2) = \cancel{(0.2)(0^2)} + (0.2)(1^2) + (0.4)(2^2) + (0.2)(3^2)$$

$$= 3.6$$

$$\text{Var}(X) = 3.6 - (1.6)^2 = 1.04$$

Find the standard deviation.

$\sigma = \sqrt{1.04} = 1.02$

Find $P(X \leq 2) = 0.8$

Find the median of the distribution.

1.5

HW

10A #1-3

10B #1-2, 5

10C #1-2

10H #6