Oppg. 4

4. $p_X(k) = \frac{\lambda^k e^{-\lambda}}{k!}$

$k = 0, 1, 2, \ldots, \infty$

(a) $Y = \sum_{i=1}^{20} X_i$ er Poissonfordelt med parameter 20λ fordi summen av n uavhengige Poissonfordelte variable er $\frac{e^{-(n\lambda)}(n\lambda)^k}{k!}$

$\lambda = \frac{1}{2}$

$p_Y(k) = \frac{10^k e^{-10}}{k!}$

$P(Y > 10) = 1 - P(Y \leq 10)$

$= 1 - \sum_{k=0}^{10} p_Y(k)$

$= 1 - e^{-10}\left(1 + 10 + \frac{10^2}{2} + \frac{10^3}{3!} + \frac{10^4}{4!} + \frac{10^5}{5!} + \frac{10^6}{6!} + \frac{10^7}{7!} + \frac{10^8}{8!} + \frac{10^9}{9!} + \frac{10^{10}}{10!}\right)$

$= 1 - e^{-10} \cdot \frac{2281587}{560}$

≈ 0.417

$P(Y > 10 \mid X_1 + X_2 = 3) = P(Y > 10 \cap$

(b) $H_0 : k = \frac{1}{2}$

$H_1 : k > \frac{1}{2}$

$Y = 16$

$\alpha = 0.05$