5.2.4 $p_X(k;\theta) = \dfrac{\theta^{2k} e^{-\theta^2}}{k!}$

$L(\theta) = \prod \theta^{2k} e^{-\theta^2} / k!$

$= \left(\theta^{2k_1} e^{-\theta^2} / k_1!\right)\left(\theta^{2k_2} e^{-\theta^2} / k_2!\right) \cdots \left(\theta^{2k_n} e^{-\theta^2} / k_n!\right)$

$L(\theta) = \theta^{2\Sigma k} e^{-n\theta^2} / \Sigma k!$

$\ln L(\theta) = 2\Sigma k \ln\theta - n\theta^2 - \ln \Sigma k!$

$\partial/\partial\theta \ln L(\theta) = \dfrac{2\Sigma k}{\theta} - 2\theta n = 0$

$\dfrac{\theta}{2n}\left(2\Sigma k/\theta\right) = (2\theta n)\dfrac{\theta}{2n}$

$\Sigma k / n = \theta^2$

$\sqrt{\Sigma k / n} = \theta$

5.2.8: $L(p) = \prod (1-p)^{k-1} p = \left[(1-p)^{k_1-1} p\right]\left[(1-p)^{k_2-1} p\right] \cdots \left[(1-p)^{k_n-1} p\right]$

$L(p) = (1-p)^{\Sigma k - n} p^n$

$\ln L(p) = \Sigma k - n \ln(1-p) + n \ln p$

$\ln L(p) = \Sigma k \ln(1-p) - n \ln(1-p) + n \ln p$

$\partial/\partial p \ln L(p) = -\Sigma k / 1-p + n/1-p + n/p = 0$

$n/p = \Sigma k - n / 1-p$

$n - np = p\Sigma k - np$

$n/\Sigma k = p$

$p = 1011 / (1)(678) + 2(227) + 3(56) + 4(28) + 5(8) + 6(14)$

$= 1011/1536 = .6582$