5.2.3. Use the sample $y_1 = 8.2$, $y_2 = 9.1$, $y_3 = 10.6$, and $y_4 = 4.9$ to calculate the maximum likelihood estimate for λ in the exponential pdf

$$f_Y(y;\lambda) = \lambda e^{-\lambda y}, \quad y \geq 0$$

5.2.4. Suppose a random sample of size n is drawn from the probability model

$$p_X(k;\theta) = \frac{\theta^{2k}e^{-\theta^2}}{k!}, \quad k = 0, 1, 2, \ldots$$

Find a formula for the maximum likelihood estimator, $\hat{\theta}$.

5.2.11. Find the maximum likelihood estimate for θ in the pdf

$$f_Y(y;\theta) = \frac{2y}{1-\theta^2}, \quad \theta \le y \le 1$$

if a random sample of size 6 yielded the measurements 0.70, 0.63, 0.92, 0.86, 0.43, and 0.21.

5.3.1. A commonly used IQ test is scaled to have a mean of 100 and a standard deviation of $\sigma = 15$. A school counselor was curious about the average IQ of the students in her school and took a random sample of fifty students' IQ scores. The average of these was $\bar{y} = 107.9$. Find a 95% confidence interval for the student IQ in the school.

5.3.14. If (0.57, 0.63) is a 50% confidence interval for p, what does $\frac{k}{n}$ equal, and how many observations were taken?