

## Answer on Question #83695 – Math – Statistics and Probability

### Question

Suppose that 55% of all babies born in a particular hospital are girls. If 7 babies born in the hospital are randomly selected, what is the probability that fewer than 2 of them are girls?

Carry your intermediate computations to at least four decimal places, and round your answer to at least two decimal places.

### Solution

Let  $X$  be the number of girls. Then  $X \sim B(n, p)$ , where  $n = 7, p = 0.55$ , hence

$$\begin{aligned} P(X = x) &= C_x^n p^x (1 - p)^{n-x} = \binom{n}{x} p^x (1 - p)^{n-x}; \\ P(X < 2) &= P(X = 0) + P(X = 1) = \\ &= \binom{7}{0} (0.55)^0 (1 - 0.55)^{7-0} + \binom{7}{1} (0.55)^1 (1 - 0.55)^{7-1} = \\ &= (0.45)^6 (0.45 + 7(0.55)) \approx 0.0041(4.3) \approx 0.0176 \approx 0.02. \end{aligned}$$

**Answer:**  $P(X < 2) \approx 0.0176 \approx 0.02$ .