in the preliminary test of gender-selected method 24 babies were born and 21 of them were boys. A. Find the number of different possible sequences of genders that are possible when 24 babies are born. B. How many ways can 21 boys and 3 girls be arranged in a sequence? C. If 24 babies are randomly selected shat is the probability that they consist of 21 boys and 3 girls? D. Does the gender-selection method appear to yeild a result

Solution

A) each baby is either a boy or a girl and there are 24; the answer is 2 to the power of 24 (written $2^{24}$) which is 16777216

B) IF GIRLS AND BOYS ARE TREATED AS CATEGORIES
number of ways = 24! / (21!*3!) =2024
IF THEY ARE TREATED AS INDIVIDUALS, E.G. G1,G2..
number of ways =24!= $6,204484 * 10^{23}$

C) $P = (24C3) * \left(\frac{1}{2}\right)^{21} * \left(\frac{1}{2}\right)^{3} = \frac{24!}{3!*21!} * \left(\frac{1}{2}\right)^{21} * \left(\frac{1}{2}\right)^{3} = 0,000121$

where $(a\ C\ b) = \frac{a!}{b!(a-b)!}$

D) as for any normal birth the probability of a boy or a girl is roughly equal, and here we have a VERY low probability; YES.