Conditions

A husband and wife have three children. The outcome of the first child being a boy, the second a girl, and the third a girl can be represented by BGG. Determine each of the following:

a)sample space that describes all the orders of the possible genders of the children
b)the event that at least one child is a girl
c)the event that at least one child is boy
d)is the event in part (C) the complement of the event in part ((b)?

Solution

a) The sample space is:

BBB,BBG,BGB,BGG,GBB,GGB,GGG,GBG

b) The event is at last 1 child is a girl is the opposite event to the event of 3 boys.

The probability of 3 boys will be is 1/8, then the probability of at least 1 girl is 1-1/8=7/8

c) The event of one child is a boy is the same (1/8), because the probability to have boy or girl in each of 3 moments is ½.
d) The event of at least 1 girl and at least 1 boy is the opposite to event “all 3 boys or all 3 girls”.

The probability of 3 boys is 1/8, of 3 girls is 1/8. Then of BBB or GGG is 1/8+1/8 = 1/4.

And the probability of at least 1 girl and at least 1 boy is 1-1/4=3/4.

Answer:

a) BBB,BBG,BGB,BGG,GBB,GGB,GGG,GBG

b) 1/8

c) 1/8

d) 3/4