four indep. 6 sided die (4 choose x)(4-x choose y)\*1/6^(x+y) \* 4/6^(4-x-y) (multinomial)

E[S | A = a] = Sum (E[Xi Yi | A = a], i=1, m)

= mE[X1Y1 |A = a]

=mE[Y1|X1 =1,A=a]P(X1 =1|A=a) =mP(Y1 =1|X1 =1,A=a)P(X1 =1|A=a).

P(Y1 =1|X1 =1,A=a)= a−1/2m-1 , P(X1 =1|A=a)= a/2m. E[S|A=a]=m a−1/2m-1 · a/2m = a(a−1) /2\*(2m-1)

2m−1 2m 2(2m−1)