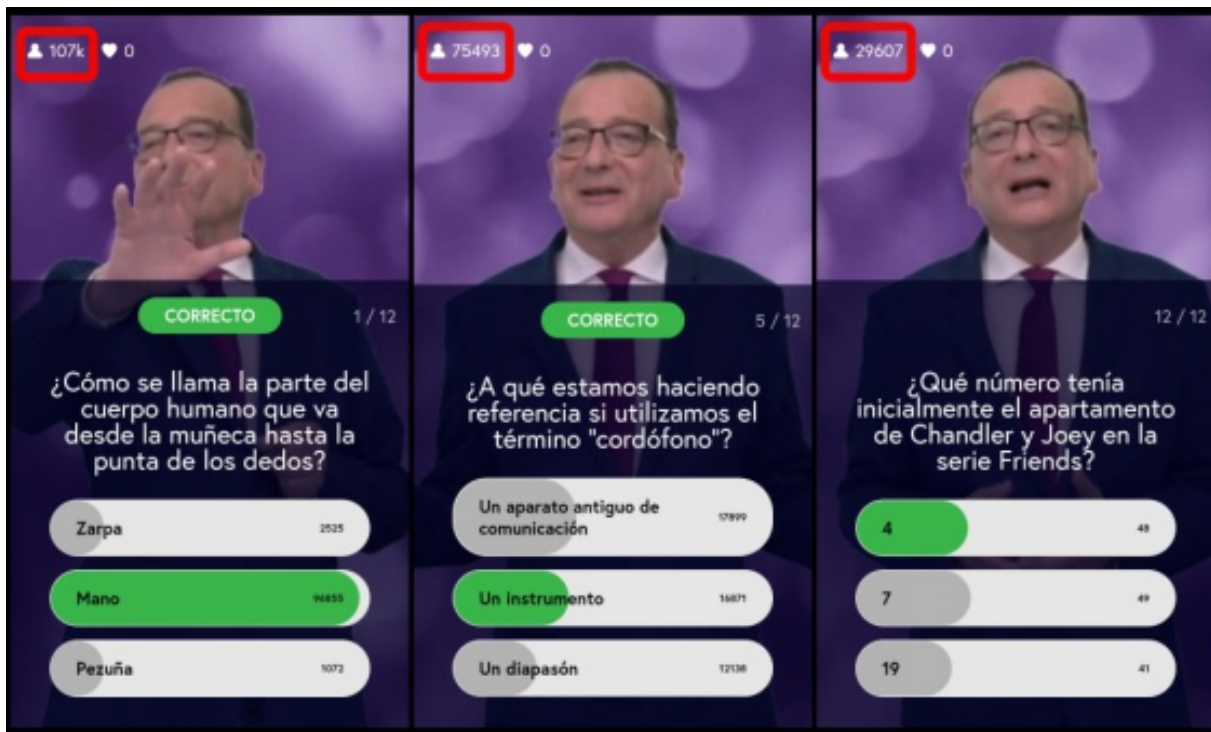# Q12 QUIZ CONTEST AND THE GEOMETRIC DISTRIBUTION
Statistics for Business, 2019 (Prof.: Josemari Sarasola)

Starting on June 2018, Q12 has become a popular quiz contest in Spain. The program is cast via Android-iOS only for mobile phones, everyday at 22:00. Around 100.000 people take part everyday in the contest. The goal is to answer correctly 12 quiz questions with 3 choices about general culture and also more specific topics. Players are removed from the day's contest when they give a wrong answer for the first time. Players remaining after the 12th question share a 500 euros prize. Questions are easy at the beginning and become more and more difficult; at the end questions are killer: people answer them randomly as they have no idea about it.

Let's suppose all questions are killer. How many players on average remain until the last question and get the prize? And what if questions are easier?

Killer questions: p(right)=1/3, as answers are random

No.Q.	Probability of being removed	Cum.prob.	No.players remaining
-	-	-	100.000
1	0.666667	0.666667	33333.3
2	0.222222	0.888889	11111.1
3	0.074074	0.962963	3703.7
4	0.024691	0.987654	1234.6
5	0.008230	0.995884	411.6
6	0.002743	0.998627	137.3
7	0.000914	0.999541	45.9
8	0.000305	0.999846	15.4
9	0.000102	0.999948	5.2
10	0.000034	0.999982	1.8
11	0.000011	0.999993	0.7
12	0.000004	0.999997	0.3

Number of questions correctly answered
before first fail with killer questions: X

Easier questions: p(right answer)=0.6

No.Q.	Probability of being removed	Cum.prob.	No.players remain
1	0.40	0.40	60000
2	0.24	0.64	36000
3	0.144	0.784	21600
4	0.0864	0.8704	12960
5	0.05184	0.922240	7776
6	0.031104	0.953344	4665.6
7	0.018662	0.972006	2799.4
8	0.011197	0.983203	1679.7
9	0.006718	0.989921	1007.9
10	0.004031	0.993952	604.8
11	0.002419	0.996371	362.9
12	0.001451	0.997822	217.8
13	0.000871	0.998693	130.7
14	0.000522	0.999215	78.5
15	0.000313	0.999528	47.2
16	0.000188	0.999716	28.4
17	0.000113	0.999829	17.1
18	0.000068	0.999897	10.3
19	0.000041	0.999938	6.2
20	0.000024	0.999962	3.8

Number of questions correctly answered
before first fail with easier questions: Y

Generally,