Introduction to Statistics

Exercises 7

PROBLEM 1. Calculate the probability that the sum of two fair dice throws is equal to 8.

PROBLEM 2. Calculate the probability of taking two black balls from a bag containing 15 red balls and 6 black balls:

a) when the first ball is not put back in the bag.
b) when the first ball is put back in the bag.

PROBLEM 3. In a first year course, a student has only studied 15 of the 25 required themes. For the course exam, two of these 25 themes are chosen at random. What is the probability that the student has studied both?

PROBLEM 4. The following table gives details about the Ministers of the new coalition government in the UK.

Name	Ministry	Political Party	Age	Sex
David Cameron	Prime Minister	Conservative	43	M
Nick Clegg	Deputy Prime Minister	Liberal Democrat	43	M
William Hague	Foreign Affairs	Conservative	49	M
George Osborne	Exchequer	Conservative	38	M
Liam Fox	Defence	Conservative	48	M
Kenneth Clarke	Justice	Conservative	69	M
Patrick McCoughlin	Chief Whip	Conservative	52	M
Theresa May	Home Secretary	Conservative	53	W
Andrew Lansley	Health	Conservative	53	M
David Laws	Treasury	Liberal Democrat	44	M
Vince Cable	Business	Liberal Democrat	67	M
Michael Gove	Education	Conservative	42	M
Eric Pickles	Local Government	Conservative	58	M
Chris Huhne	Energy and Climate Change	Liberal Democrat	55	M
Danny Alexander	Scotland	Liberal Democrat	38	M
Iain Duncan Smith	Work and Pensions	Conservative	56	M
Dominic Grieve	Attorney General	Conservative	53	M

If a minister is chosen at random:

a) What is the probability that they are Conservative?
b) If they are over 50, what is the probability that they are conservative.
c) Are the events “over 50” and “Conservative” independent? Why?

PROBLEM 5. Before the last Greek elections, a small European survey was carried out. Each participant was asked to give their nationality and their opinion about whether Greece should continue in the Euro.

		Country	
		Greece	Others
¿Should Greece stay in the Euro?	Yes	20	60
	No	80	10
	No reply	10	20

a) If one of the participants in the survey is chosen at random, what is the chance that they are Greek?

b) What is the probability that they think Greece should continue in the Euro.

c) Are the events "come from Greece" and "think Greece should stay in the Euro" independent? Why?

d) If two of the participants are chosen at random, what is the probability that they both think Greece should stay in the Euro?

PROBLEM 6. The following results come from the CIS survey of 2010.

Pregunta 3

Y, ¿cree Ud. que dentro de un año la situación económica del país será mejor, igual o peor que ahora?

Mejor	22.0
Igual	38.4
Peor	26.9
N.S.	12.3
N.C.	.3
(N)	(2479)

If these results are representative of Spain, the probability that three independent people all think that the situation will get worse (peor) is approximately

a. 0,26900
b. 0,01947
c. 0,80700
d. 0,05662

PROBLEM 7. The following results come from the last CIS survey.

Las personas, algunas veces, pertenecen a ciertos grupos o asociaciones. Para cada uno de los grupos que le voy a leer a continuación, dígame, por favor, si Ud.:

1. Pertenece y participa activamente
2. Pertenece, pero no participa activamente
3. Antes pertenecía, pero ahora no
4. Nunca ha pertenecido a ninguno de esos grupos

	1	2	3	4	N.C.
Un partido político	1.8	1.4	4.1	92.4	.3
Un sindicato o una asociación de empresarios	3.7	6.0	8.7	81.3	.2

If these results are representative of Spain, the probability that two independent people belong (*pertenece*) actively or not, to a political party is:

a) 0,0064
b) 0,001024
c) 0,64
d) 0,146