PROBABILITY TEST – 4º ESO

Exercise 1: (1 pto) Given a certain random experiment with sample space $E=\{1,2,3,4,5,6,7,9\}$, let's consider the events $A=\{1,3,7\}$, $B=\{5,6,7\}$, $C=\{1\}$. Work out:

a) $A\cup B=\{1,3,5,6,7\}$

b) $A\cap B=\{7\}$

c) $B\cap C=\varnothing$

d) $\overline{B}=\{1,2,3,4,9\}$

Exercise 2: (1.5 ptos) I have an urn with 7 white balls, 4 green balls and 5 red balls. I get 3 balls **without** replacement. Find the probability that:

a) I get three red balls → $P(R_1\cap R_2\cap R_3)=\frac{1}{56}$

b) I get two white balls and a green one

→ $P(W_1\cap W_2\cap G_3)+P(W_1\cap G_2\cap W_3)+P(G_1\cap W_2\cap W_3)=\frac{3}{20}$

c) I get at least a red ball → $P(\text{at least one red})=\frac{79}{112}$

Exercise 3: (1.5 ptos) I get two cards **with** replacement from a Spanish deck of cards. Find the probability that:

a) Both of them are horse cards → $P(H_1\cap H_2)=\frac{1}{100}$

b) I get a face card and an ace card → $P(F_1\cap A_2)+P(A_1\cap F_2)=\frac{3}{50}$

c) I don't get any cup cards → $P(\overline{C}_1\cap\overline{C}_2)=\frac{9}{16}$

Exercise 4: (2 ptos) Given two events A and B of a random experiment so that $P(A)=0.3$, $P(\overline{B})=0.2$ and $P(A\cup B)=0.86$ work out:

a) **(0.75)** $P(A\cap B)=0.24$

b) **(0.5)** $P(B/A)=0.8$

c) **(0.75)** Are A and B independent events? Are they mutually exclusive? Why?

They are independent events but they are not mutually exclusive

$P(A\cap B)=P(A)\cdot P(B)$ $\qquad$ $P(A\cap B)\neq 0$

Exercise 5: (2 ptos) 75% of the people at a working center drink coffee in the mornings, 20% drink tea and 10% drink both beverages. Taking an employee find the probability that:

a) **(0.75)** They drink coffee knowing that they drink tea → $P(C/T)=0.5$

b) **(1.25)** They drink neither coffee nor tea → $P(\bar{C}\cap\bar{T})=0.15$

Exercise 6: (2 ptos) 45% of the Spanish people going on holidays this next summer will jump on a plane, 30% of them will take the train and the rest will use their cars. 15% of the ones using the plane, 25% of the ones using the train and 60% of the ones using a car are headed to the beach. Taking a random person find the probability that:

a) They are going to the beach → $P(B)=0.2925$

b) They will use the car knowing that they won't go to the beach → $P(C/\bar{B})=0.1413$