ANALYTIC GEOMETRY AND PROBABILITY TEST

4º ESO

Exercise 1: (1.5 ptos) 37% of the adults of a certain village go to supermarket A to get the supplies for the week, while the rest of them go to supermarket B. 80% of the people who prefer supermarket A and 65% of the ones who prefer supermarket B also buy their fresh products in there. Getting a random person in the village find the probability that:

a) They buy fresh products in a supermarket $P(F) = 0.7055$

b) They go to supermarket B knowing that they buy their fresh products in local stores

$P(B/\bar{F}) = 0.7487$

Exercise 2: (1.5 ptos) In a certain village, not necessarily the same one, 70% of the adults buy fresh products in a supermarket, 35% in local stores, and 15% in both places depending on the prices and the quality. Find the probability that, when buying fresh products:

a) They go to the supermarket or the local stores $P(S \cup L) = 0.9$

b) They go to a local store, given that they go to the supermarket $P(L/S) = 0.2143$

c) They don't go to any of them (you can have a farm, ask for junk food or steal it from your mother when you go for a visit, as we have all done sometimes) $P(\bar{L} \cap \bar{S}) = 0.1$

Exercise 3: (2 ptos) I get two cards of a Spanish deck without replacement. Find the probability of the following events:

a) I get two cup cards $P(C_1 \cap C_2) = 3/52$

b) I get an ace and a king $P(A \cap K) = 4/195$

c) I don't get any face cards $P(\bar{F}_1 \cap \bar{F}_2) = 63/130$

d) I get at least a jack $P(\text{at least a jack}) = 5/26$

Exercise 4: (1 pto) Find the general equation of the straight line going through $P(3,-2)$ and $Q(5,9)$

$11x - 2y - 37 = 0$

Exercise 5: (2 ptos) Given the straight line $r \equiv \dfrac{x+5}{2} = \dfrac{y-1}{-7}$

a) Indicate a point and the direction vector $P(-5,1)$ $\vec{u} = (2,-7)$

b) Find its parametric equation $r \equiv \begin{cases} x = -5 + 2t \\ y = 1 - 7t \end{cases}$

c) Find the general equation of a parallel line going through the point $A(-1,4)$ $7x + 2y - 1 = 0$

d) Find the general equation of a perpendicular line going though the point $B(2,-9)$

$2x - 7y - 67 = 0$

Exercise 6: (1.5 ptos) Find the parametric and continuous equations of the straight line $r \equiv 5x - y - 3 = 0$, indicating previously a point of the line and the direction vector

$$P(1,2) \quad \vec{u} = (1,5) \;\rightarrow\; r \equiv \begin{cases} x = 1+t \\ y = 2+5t \end{cases} \;\rightarrow\; x-1 = \frac{y-2}{5}$$

Exercise 7: (0.5 ptos) Indicate a point and the direction vector of $r \equiv \begin{cases} x = 2t-5 \\ y = -t \end{cases} \;\rightarrow\; \begin{array}{l} P(-5,0) \\ \vec{u} = (2,-1) \end{array}$