

Print **all** group member's names here. Circle the name of the group member who turns this in.

A survey of 75 automobiles parked on a university campus lot classified the brands by country of origin and by the type of parking permit (student or faculty/staff).

	American car (A)	European car (E)	Asian car (N)	
student (S)	25	10	15	
faculty/staff (F)	9	4	12	

- Suppose we choose a car at random. Find the following probabilities (leave your answer as fractions; do not reduce):
 - $P(S)$
 - $P(E)$
 - $P(\bar{N})$
 - $P(S|A)$
 - $P(E \cap S)$
 - $P(E \cap N)$
 - $P(E \cup F)$
 - $P(E \cup N)$
- Are the events A and S independent or dependent? Justify your answer with the correct notation and computations. (a) use conditional probabilities; (b) use intersections
- Are the events E and F independent or dependent? Justify your answer with the correct notation and computations. (a) use conditional probabilities; (b) use intersections

4. Now suppose we have a medical test with the following results:

	Positive test	Negative test	
Have the disease	37	13	
Do not have the disease	15	285	

Express each of these as a conditional probability (using the correct probability notation), and then give the answer as a fraction (no need to reduce):

- (a) the **sensitivity** (the probability of a positive test, given that the patient has the disease):
- (b) The **specificity** (the probability of a negative test, given that the patient is well):
- (c) The **PPV** (positive predictive value, the probability they have the disease if they test positive):
- (d) The **NPV** (Negative predictive value, the probability they are well if they test negative):
- (e) The **false positive rate** (the probability the person tests positive, given that they do not have the disease):
- (f) The **false negative rate** (the probability the person tests negative, given that they have the disease):