Please do not write on this exam paper and do not forget to give it back at the end of the test

Subject n°13   **PROBABILITIES**

An association offers a paying field trip to its members. The members can either choose to bring their own lunch box or pay a supplement for the meal.
The table below shows the different fees to be paid depending on the age of the members.

Category	A: Adult	T: Teenagers	C: Children
Field trip price	€ 20	€ 15	€ 8
Meal price	€ 6	€ 5	€ 3

The association has signed up 87 participants to the field trip, of which 58 adults and 12 children.
Half of the adults, 25% of the children and ten teenagers have brought their own lunch box.

We choose one participant randomly and study the following events:

A: "the participant is an adult";

T: "the participant is a teenager";

C: "the participant is a child";

M: "the participant takes the meal proposed by the association".

1. Draw a tree to represent the situation.
2. a) Calculate the probability of event T.

   b) Calculate the probability of event $M \cap A$.

3. Prove that $p(M) = \frac{14}{29}$.

4. We denote X the random variable giving the price paid by a participant.

   a) Give all the values taken by X.

   b) Give the probability distribution of X and calculate the average price.