Use a counting argument to establish each of the following. Make sure you justify each step of your argument.

1. How many arrangement of the letters in the word TENNESSEE give a recognizably different string of letters?

2. A 5-person team is to be formed from a group of 12 people.
   (a) How many are possible?
   (b) What if players A and B must both be on the team?
   (c) What if A and B cannot both be on the team?
   (d) What if neither A nor B is on the team?
   (e) What if one but not both of A and B is on the team?

3. A committee of 12 students is to be chosen from a group of 8 juniors and 10 sophomores. How many committees can be formed having:
   (a) more juniors than sophomores?
   (b) an odd number of sophomores?

Answers:

1. 3780
2. (a) 792; (b) 120; (c) 672; (d) 252; (e) 420
3. (a) 2226; (b) 9296