

## Pop quiz: Permutations with specific positions

1) Six Pure Math 30 students (Brittany, Geoffrey, Jonathan, Kyle, Laura, and Stephanie) are going to stand in a line: How many ways can they stand if:

- a) Stephanie must be in the third position?
- b) Geoffrey must be second and Laura third?
- c) Kyle can't be on either end of the line?
- d) Boys and girls alternate, with a boy starting the line?
- e) The first three positions are boys, the last three are girls?
- f) A girl must be on both ends?
- g) The row starts with two boys?
- h) The row starts with exactly two boys?
- i) Brittany must be in the second position, and a boy must be in the third?



2) How many ways can you order the letters from the word TREES if:

- a) A vowel must be at the beginning?
- b) It must start with a consonant and end with a vowel?
- c) The R must be in the middle?
- d) It begins with an E?
- e) It begins with exactly one E?
- f) Consonants & vowels alternate?