1. An operation # on the set of integers is defined by : $a\#b = ab - ba$. Is it commutative? Is it associative? Try to define operations $*$ on the set of integers which are not same as addition or multiplication, but are associative and/or commutative.

2. What do you understand by the word 'symmetry'? Discuss with others how do they percieve the concept of symmetry?

3. *For those who have multiplied matrices* - Why matrix multiplication is defined in such a complicated manner?

4. Shuffling objects (usually of the same type) is called a 'permutation'. Someone tells you, "*for every permutation there is an inverse permutation*". How will you interpret the word "inverse permutation"?

5. Have you heard of complex numbers? Can you use complex numbers to derive well known formulae for $\cos(\theta + \phi), \cos(\theta - \phi), \sin(\theta + \phi), \sin(\theta - \phi)$? Does it have something to do with rotation in two dimensions?

6. Lookout for the following puzzles/games : 15-puzzle, peg solitaire, Rubik's cube. If you play them well, you would enjoy this course. All the best!