You may work in pairs, and submit one answer sheet for the pair.

1. Consider South Carolina’s license plate, which is three letters followed by a three-digit number. (Leave answers as products.)
   (a) How many possible license plates are there if the number must be even?
   (b) How many possible license plates are there if no vowels allowed? (Assuming 5 vowels.)
   (c) How many possible license plates are there if all letters and digits must be distinct?
   (d) How many possible license plates are there if we change the rules to allow either 3 or 4 letters?

2. Consider 5-letter words again.
   (a) How many start and finish with a vowel?
   (b) How many have at most one vowel?
   (c) How many have exactly three vowels with no two vowels next to each other?

3. Consider 5 boys and 5 girls.
   (a) In how many ways can they line up for the bus with a girl in front?
   (b) In how many ways can they line up for the bus with both a girl in front and at the back?
   (c) In how many ways can they line up for the bus with a girl in front or at the back or both?
   (d) In how many ways can they line up for the bus with no two girls next to each other?

4. If we write out 30!, how many zeroes are there at the end?

Due: 10am Wednesday 25 August