MAS334 COMBINATORICS 2017/2018

Feedback on homework 2

Questions 1, 3 and 5 from Example Sheet 2, marked out of 5, 6 and 9 respectively; total out of 20.

- Parity
  - A parity check is not generally enough to show something *is* possible. Do this directly, by stating a way to do it.
  - A parity mismatch shows something is impossible. (It's not enough to show that some particular method fails; you need to show that there is no method that works.)

- Pigeon-hole Principle
  - Say what the items are and how the PHs are labeled. If the question tells you, follow what you are told and check how the PHP applies.

- Inclusion/Exclusion Principle
  - Say what the items are, what the properties are and what you need to calculate in terms of these items and properties.
  - The number of integers in the range $1, 2, \ldots, 10$ divisible by 3 is $\lfloor \frac{10}{3} \rfloor = 3$. It is not $\frac{10}{3}$ (obviously, since this is not an integer).
  - Don't ignore this issue until you get to the end and then randomly take the integer part at the point where you notice your method has produced a non-integer answer!
  - What this means is that your method is wrong! So you can't just change your answer, you need to identify what went wrong earlier.
  - Bluffing will usually be detected and risks irritating your marker!

- General points
  - $\Rightarrow$ means "implies"
  - $=$ means "equals"

Please ask me if you would like extra feedback/help.