

Instructions

- Answer each question completely; justify your answers.
 - This assignment is due at 15:00 on Friday September 27th in Assignment Box #34.
1. Exercise 5.1.20.
 2. Exercise 5.1.34.
 3. Suppose you have six distinct apples, five distinct pears and four distinct plums in your kitchen.
 - (a) How many ways are there to select five pieces of fruit?
 - (b) How many ways are there to arrange five pieces of fruit on the window sill?
 4. Suppose you have six identical apples, five identical pears and four identical plums in your kitchen.
 - (a) How many ways are there to select five pieces of fruit?
 - (b) How many ways are there to arrange five pieces of fruit on the window sill?
 5. Exercise 5.2.4.
 6. Exercise 5.2.10.
 7. Exercise 5.2.38.
 8. Exercise 5.2.42.
 9.
 - (a) Consider a cube that is fixed in its position. How many ways are there to colour the six faces of the cube with six colours, given that no colour can be used more than once?
 - (b) If the cube is no longer fixed in position but is now allowed to move freely, then several of the colourings that were considered distinct in part (a) now become equivalent. For each particular colouring \mathcal{C} from (a), what is the number of colourings from part (a) that are now equivalent to \mathcal{C} ?
 - (c) How many non-equivalent ways are there to colour the six faces of a free-floating cube with exactly 6 colours (i.e. such that each colour is used exactly once)?