

# Quiz 1 Solutions

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September 24, 2008

**Problem 1.** (a) Glue the  $c$  and  $d$  together and treat it as one symbol. There are 2 ways to glue them. Now we want to arrange 5 symbols in a row. There are  $5!$  ways to do this. So the answer is  $2 \times 5!$

(b) Choose 2 slots for the  $c$  and  $d$ :  $\binom{6}{2}$  ways. Now place the  $c$  and  $d$  in those slots, with  $c$  followed by  $d$ .

Now, in the remaining slots we must arrange the 4 letters:  $4!$  ways. So the answer is  $\binom{6}{2} \times 4!$ .

**Problem 2.** This question is just like Problem 66 in HW2. If all members of the Senior committee must be older than all members of the Junior committee, then choosing the two committees is the same as choosing one group of  $25 + 20 = 45$  people and then dividing them into the youngest 20 and oldest 25. So the answer is  $\binom{100}{45}$