Tutorial ...

Name:_____

ID:_____

Mathematics 1E2 2006–07

HW 13 Due 12/2/06

(1)(10 marks) Let A be the event 'Out of five coin-tosses, the number of heads is odd.' List the 16 points in A, in lexicographical order, beginning with HHHHH. (Thus if H=0 and T=1, and the numbers are interpreted in binary, we get ascending order.)

(2)(12 marks) Continuing question (1): for $0 \leq i \leq 5$, calculate the *conditional* probability (relative to A) that there are i heads, given A.

(3)(12 marks) Cars arrive at a traffic light at a rate of 4 cars per length of red signal (cars arriving on green or orange go straight through). What is the probability that (i) exactly 5 (ii) at least 5 cars will be waiting at the lights when the lights change?

(4)(16 marks) A product is made on four assembly lines A,B,C,D, with relative rates of production $4:3:2:1$ and probabilities $5\%, 10\%, 10\%$, and 25% of being defective. Calculate the probabilities that a defective product came from (i) A, (ii) B, (iii) C, or (iv) D.