

Name \_\_\_\_\_

## Mathematics 2602

Quiz 5

Prof. Margalit

5 October 2011

1. A fair coin is tossed six times. Find the probability that the total number of heads is strictly greater than the total number of tails.

Solution 1:

$$\begin{aligned} & P(\# \text{ of heads} > \# \text{ of tails}) \\ &= P(\text{getting 4 heads or 5 heads or 6 heads}) \\ &= \frac{\binom{6}{4} + \binom{6}{5} + \binom{6}{6}}{2^6} = \frac{11}{32} \end{aligned}$$

Solution 2:

$$\begin{aligned} & \therefore P(\# \text{ of heads} > \# \text{ of tails}) \\ &= P(\# \text{ of tails} > \# \text{ of heads}) \\ & \therefore P(\# \text{ of heads} > \# \text{ of tails}) \\ &= \frac{1}{2} (1 - P(\# \text{ of heads} = \# \text{ of tails})) \\ &= \frac{1}{2} \left(1 - \frac{\binom{6}{3}}{2^6}\right) = \frac{11}{32} \end{aligned}$$