

UNIVERSITY OF HONG KONG
DEPARTMENT OF MATHEMATICS
MATH1853
Tutorial 3

1. Let $\omega^3 = 1$ and $\omega \neq 1$. Find the value of $\omega^{2011} + \omega^{1997} + 1$.
2. Show that $\tanh(ix) = i \tan(x)$.
3. From a group of 5 women and 7 men, how many different committees of 2 women and 3 men can be formed? What if 2 of the men refuse to serve on the committee together?
4. We have a supply of flowers of 3 different colours: red, white and yellow. How many ways are there to choose 4 flowers, provided we choose at least 1 flower of each colour? With the problem as above but we drop the requirement that at least one flower of each colour is to be chosen, what will be the number of ways?
5. If two fair dice are rolled, what is the probability that the sum of the upturned faces will equal 6?
6. If it is assumed that all $\binom{52}{5}$ poker hands are equally likely, what is the probability of being dealt
 - (a) a flush? (A hand is said to be a flush if all 5 cards are of the same suit.)
 - (b) one pair? (This occurs when the cards have denominations a, a, b, c, d , where a, b, c , and d are all distinct.)
 - (c) two pairs? (This occurs when the cards have denominations a, a, b, b, c , where a, b , and c are all distinct.)
 - (d) three of a kind? (This occurs when the cards have denominations a, a, a, b, c , where a, b , and c are all distinct.)
 - (e) four of a kind? (This occurs when the cards have denominations a, a, a, a, b .)
7. A closet contains 10 pairs of shoes. If 8 shoes are randomly selected, what is the probability that there will be no complete pair?