

General Mathematics and Computational Science I

Exercise 12

October 23, 2007

1. A card is drawn at random from a standard deck of 52 cards. What is the probability of drawing
 - (a) a king of spades?
 - (b) a king?
 - (c) not a king?
 - (d) a diamond?
 - (e) a face card (jack, queen, or king)?

2. In the game of Yahtzee (or Yacht), five dice are thrown. Show that the probability of throwing a *large straight* (5 numbers in a row, the order does not matter) is $\frac{5}{162}$.

Alternatively, you may solve the following, harder, problem. Show that the probability of throwing a *small straight* (4 numbers in a row) is $\frac{10}{81}$. Do not count small straights which are also large straights.

(The actual rules of the game allow to repeat throwing a selected subset of dice twice. This is considerably more complicated to analyze.)