**Mathematics 1550H – Introduction to Probability**

TRENT UNIVERSITY, Summer 2015

**Assignment #2**

*Due on Monday, 13 July, 2015.*

**Go straight inside.**

For the purposes of this assignment the pips on the cards of a standard 52-card deck will be ranked $A\,K\,Q\,J\,10\,9\,8\,7\,6\,5\,4\,3\,2$ and the suits will be ranked $\heartsuit\,\diamondsuit\,\clubsuit\,\spadesuit$, from highest to lowest in both cases. We will be dealing with five-card hands drawn at random from the deck. Recall that a *straight* is a hand in which the cards are in consecutive order by pips, with going around the end of the rank order not being allowed (so, for example, $4\,3\,2\,A\,K$ would not count as a straight).

**1.** Suppose you draw a five-card hand from the deck and get four cards that that would make a straight if you could replace the fifth card. (*e.g.* $J\,10\,9\,8\,3$ or $K\,7\,6\,4\,3$). If you are allowed to discard the fifth card and draw one at random from the remaining 47 cards, what is the probability that your modified hand will be a straight? *[10]*

*Hint:* There are at least three cases to consider ...