1. In some cases, measures of association for categorical variables are useful even when the underlying variables are continuous if the question being addressed can be expressed in terms of variables that take only two values. For instance, suppose we are interested in the relationship between Tom Brady's success in passing in a given game and the pressure exerted by the defense's pass rush. Although there are many variables that could be used to address this issue in a formal analysis, here we consider the relationship between touch-down passes, denoted by T, and sacks, denoted by S.

Table 1: Sacks and touch-down passes for Brady in the 2009-2012 seasons

		Touch-down Passes		
		0-2	3 or more	Total
Sacks	0-2	29	22	51
	3 or more	18	2	20
	Total	47	24	

(a) (8 points) Compute the correlation coefficient. Interpret this number. Is this correlation significant?

(b) (5 points) Compute the α, the cross-product ratio. Interpret this number.

(c) (5 points) Compute the Q, Yule's Q. Interpret this number.