Joint Probability Distributions - Discrete Case

(1) A supermarket has two express lines. Let X and Y denote the number of customers in the first and in the second, respectively, at any given time. During non-rush hours, the joint pdf of X and Y is summarized by the following table:

		X			
		0	1	2	3
Y	0	0.1	0.2	0	0
	1	0.2	0.25	0.05	0
	2	0	0.05	0.05	0.025
	3	0	0	0.025	0.05

Find $P(|X - Y| = 1)$, the probability that X and Y differ by exactly 1.

(2) Suppose two fair dice are rolled. Let X be the sum of the numbers showing, and let Y be the larger of the two. Find $p_{X,Y}(2, 3)$, $p_{X,Y}(4, 3)$, and $p_{X,Y}(6, 3)$.

(3) From a group of three Republicans, two Democrats, and one independent, a committee of two people is to be randomly selected. Let X denote the number of Republicans and Y denote the number of Democrats on the committee. Find the joint probability density function of X and Y and then find the marginal pdf of X.