

**3.15** (a)  $1 - P_{(X,Y)}(0,0) = 1 - 0.52 = 0.48.$

(b) Compute the marginal distributions of  $X$  and  $Y$ ,

$$P_X(x) = \sum_{y=0}^2 P(x,y) \text{ and } P_Y(y) = \sum_{x=0}^2 P(x,y)$$

$P(x,y)$		$x$			$P_Y(y)$
		0	1	2	
$y$	0	0.52	0.20	0.04	0.76
	1	0.14	0.02	0.01	0.17
	2	0.06	0.01	0	0.07
$P_X(x)$		0.72	0.23	0.05	

Variables  $X$  and  $Y$  are dependent. For example,  $P_{(X,Y)}(2,2) \neq P_X(2)P_Y(2)$  because  $(0.05)(0.07) \neq 0$ .