

Ex 9.3

Use the above Table

a) $P(X=Y) = ?$

$$P(X=Y) = P(1,1) + P(2,2) + P(3,3) + P(4,4)$$

(All values of $a=b$)

so

$$P(X=Y) = \frac{16}{136} + \frac{10}{136} + \frac{7}{136} + \frac{1}{136} = \boxed{\frac{1}{4}}$$

b) $P(X+Y=5)$

(All values of a and b where $a+b=5$)

so

$$P(X+Y=5) = P(1,4) + P(2,3) + P(3,2) + P(4,1)$$

$$= \frac{4}{136} + \frac{6}{136} + \frac{11}{136} + \frac{13}{136}$$

$$= \boxed{\frac{1}{4}}$$

$$\textcircled{c} \quad P(1 < X \leq 3, 1 < Y \leq 3) = ?$$

(all values of a and b s.t.

$$1 < a \leq 3, b \leq 3$$

$$\text{or } a = 2, 3 \quad b = 2, 3)$$

$$= P(2, 3) + P(3, 2) + P(2, 2) + P(3, 3)$$

$$= \frac{11}{136} + \frac{10}{136} + \frac{6}{136} + \frac{7}{136}$$

$$= \boxed{\frac{1}{4}}$$

$$\textcircled{d} \quad P((X, Y) \in \{1, 4\} \times \{1, 4\}) = ?$$

$$= P(1, 1) + P(1, 4) + P(4, 1) + P(4, 4)$$

$$= \frac{16}{136} + \frac{4}{136} + \frac{13}{136} + \frac{1}{136}$$

$$= \boxed{\frac{1}{4}}$$