17. (1)

X \ Y	0	1	
-1	$\frac{1}{4}$	0	$\frac{1}{4}$
0	0	$\frac{1}{2}$	$\frac{1}{2}$
2	$\frac{1}{4}$	0	$\frac{1}{4}$
	$\frac{1}{2}$	$\frac{1}{2}$	

$\therefore$

$Y\mid X=0$	0	1
$P(Y\mid X=0)$	0	1

(2) $P(X=0, Y=0)=0 \neq P(X=0)\cdot P(Y=0)=\frac{1}{4}$

不独立

20.

(1) $\begin{cases} f_X(x)=\int_{-\infty}^{\infty} f(x,y)\,dy=\int_0^{\frac{x}{2}} \frac{3}{4}x\,dy=\frac{3}{8}x^2, & 0\leq x\leq 2 \\ f_X(x)=0, & \text{其他} \end{cases}$

$\begin{cases} f_Y(y)=\int_{-\infty}^{\infty} f(x,y)\,dx=\int_{2y}^2 \frac{3}{4}x\,dx=\frac{3}{2}-\frac{3}{2}y^2, & 0\leq y\leq \frac{x}{2} \\ f_Y(y)=0, & \text{其他} \end{cases}$

(2) $f(x,y) \neq f_X(x)\cdot f_Y(y)$

不独立

21.

$\frac{1}{24}x^3\Big|_0^1 \cdot \frac{1}{8}y^2$
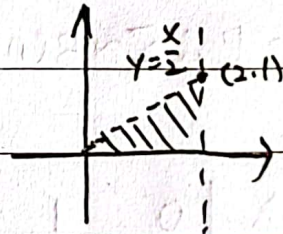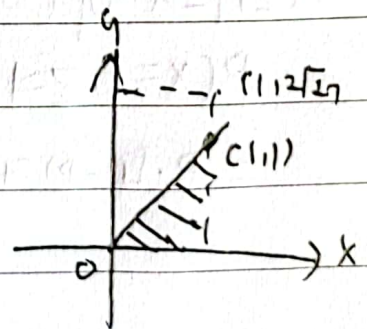
$f(x,y)=f_X(x)\cdot f_Y(y)=\begin{cases} \frac{1}{4}y, & 0<x<1,\ 0<y<2\sqrt{2} \\ 0, & \text{其他} \end{cases}$

$P(x>y)=\int_0^1 \int_0^x \frac{1}{4}y\,dy\,dx=\int_0^1 \frac{1}{8}x^2\,dx$

$=\frac{1}{24}$

$\frac{1}{8}x^2$

25.

Z	0	1	2	3	4	5	6	7	8
P(Z)	0	0.02	0.06	0.13	0.19	0.24	0.19	0.12	0.05

M	0	1	2	3	4	5
P(M)	0	0.04	0.16	0.28	0.24	0.28

N	0	1	2	3
P(N)	0.28	0.3	0.25	0.17

27. $P(Z=K) = \sum\limits_{i=0}^{K} P(X=i) P(Y=k-i)$

$= \sum\limits_{i=0}^{K} C_n^i \cdot p^i \cdot (1-p)^{n-i} \cdot C_m^{k-i} p^{k-i} \cdot (1-p)^{m-k+i}$

$= \sum\limits_{i=0}^{K} C_n^i \cdot C_m^{k-i} \cdot p^k \cdot (1-p)^{m+n-k}$

$= C_{n+m}^k \cdot p^k \cdot (1-p)^{m+n-k}$

∴ $Z \sim B(n+m, p)$

29.

X	0	1
P(X)	1-P	P

Y	0	1
P(Y)	1-P	P

$(2p^2+1)(2p^2+1)$

$2p^2-2p+1 = p$

$2p^2-3p+1 = 0$

Z	0	1
P(Z)	2P(1-P)	$(1-p)^2+p^2$

$P(X=1, Z=1) = P(X=1) \cdot P(Y=1) = p^2 = P(Z=1) \cdot P(X=1)$ 手

$= P \cdot [(1-P)^2 + P^2]$ ⇒ $(1-P)^2 + P^2 = P$, $P = \frac{1}{2}$ 或 1