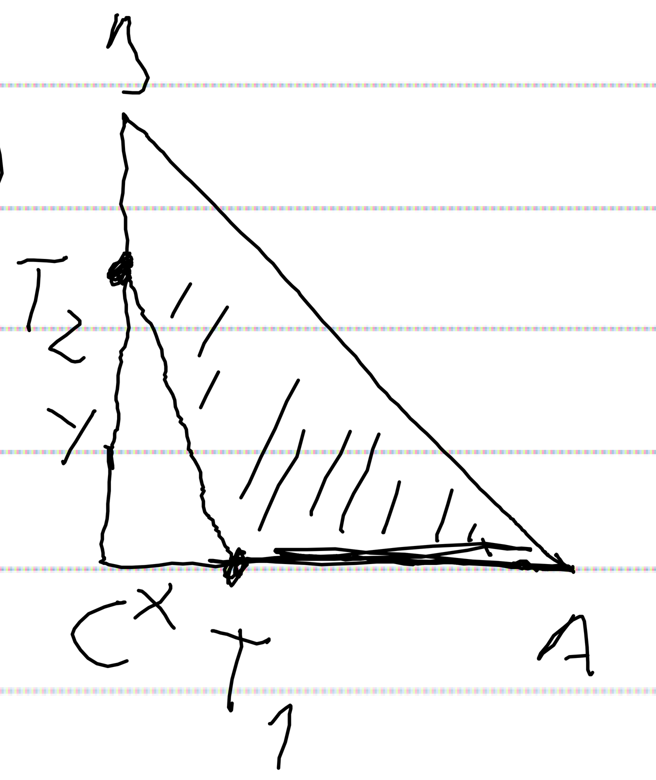
1. MI MASS

1) a) $|\Omega| = 12^{12}$

$$P(A) = \frac{\binom{12}{6}\binom{12}{2}\binom{10}{2}\binom{8}{2}\binom{6}{2}\binom{4}{2}\binom{2}{2}}{12^{12}}$$

b) $$P(B) = \frac{\binom{12}{6}\binom{30}{3}\binom{27}{3}\binom{24}{3}\binom{21}{3}\binom{18}{3}\binom{15}{3}\binom{12}{2}\binom{10}{2}\binom{8}{2}\binom{6}{2}\binom{4}{2}\binom{2}{2}}{12^{30}}$$

2)

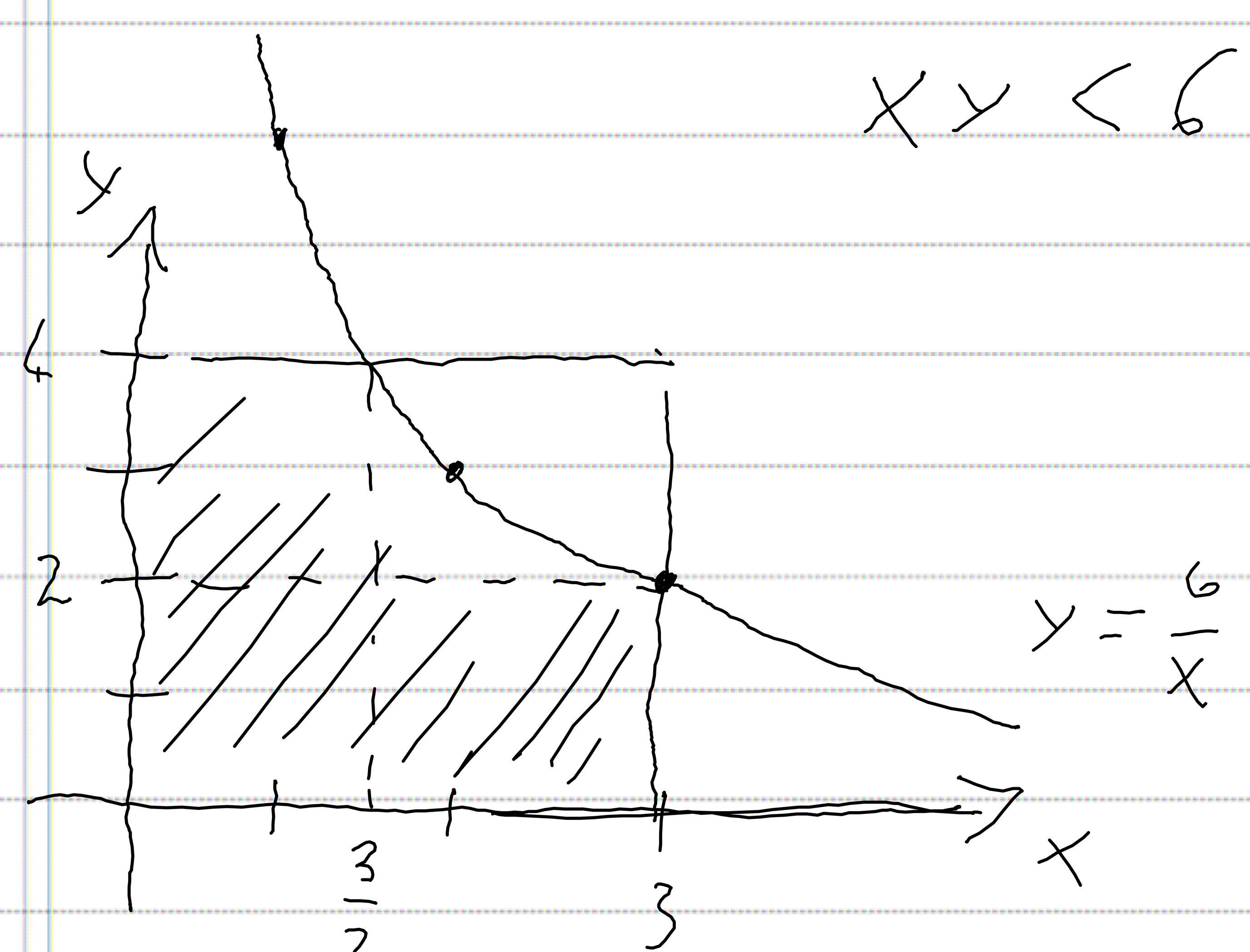


$x \in (0, 3)$ $\qquad P_\Delta = 6$

$y \in (0, 4)$

$P_{\check{C}} = 6 - \frac{1}{2}xy > \frac{1}{2} \cdot 6$

$xy < 6 \qquad y < \frac{6}{x}$



$$P(A) = \frac{P_A}{P_\Omega} = \frac{12 - \int_{\frac{3}{2}}^{3} 4 - \frac{6}{x}\,dx}{12}$$

$$= \frac{12 - 4x + 6\ln x \Big|_{\frac{3}{2}}^{3}}{12}$$

$$= \frac{1}{2} + \frac{1}{2}\ln 2$$

3) $$P(H_0) = \frac{48}{52} \cdot \frac{\binom{48}{2}}{\binom{52}{2}}$$

$$P(H_1) = \frac{\binom{4}{1}}{\binom{52}{1}} \cdot \frac{\binom{48}{2}}{\binom{52}{2}} + \frac{\binom{48}{1}}{\binom{52}{1}} \cdot \frac{\binom{4}{1}\binom{48}{1}}{\binom{52}{2}}$$

$$P(H_2) = \frac{\binom{4}{1}}{\binom{52}{1}} \cdot \frac{\binom{4}{1}\binom{48}{1}}{\binom{52}{2}} + \frac{\binom{48}{1}}{\binom{52}{1}} \cdot \frac{\binom{4}{2}}{\binom{52}{2}}$$

$$P(H_3) = \frac{\binom{4}{1}}{\binom{52}{1}} \cdot \frac{\binom{4}{2}}{\binom{52}{2}}$$

$$A = \{\text{izvučen as}\}$$

$$P(H_3 \mid A) = \frac{P(H_3) \cdot P(A \mid H_3)}{\sum P(H_i) P(A \mid H_i)}$$

$$P(A \mid H_0) = 0$$

$$P(A \mid H_1) = \frac{1}{3}$$

$$P(A \mid H_2) = \frac{2}{3}$$

$$P(A \mid H_3) = 1$$

4)

$$X_i \sim \begin{pmatrix} 2 & -0.5 \\ 0.7+0.3\cdot\frac{1}{5} & 0.24 \end{pmatrix}$$

$$E(X_i) = 2\cdot 0.76 + (-0.5)\cdot 0.24 = 1.4$$

$$E(X) = \sum E(X_i) = 20\cdot 1.4 = 28$$

5)

$X \backslash Y$	0	1	2	3	
0	0	$\frac{6}{36}$	0	$\frac{3}{36}$	$\frac{9}{36}$
1	$\frac{4}{36}$	$\frac{4}{36}$	$\frac{8}{36}$	$\frac{2}{36}$	$\frac{18}{36}$
2	$\frac{3}{36}$	0	$\frac{6}{36}$	0	$\frac{9}{36}$
	$\frac{7}{36}$	$\frac{10}{36}$	$\frac{14}{36}$	$\frac{5}{36}$	

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b)

$$U \sim \begin{pmatrix} 0 & 1 & 4 \\ \frac{9}{36} & \frac{18}{36} & \frac{9}{36} \end{pmatrix}$$

$$V \sim \begin{pmatrix} 0 & 1 & 2 \\ \frac{16}{36} & \frac{14}{36} & \frac{6}{36} \end{pmatrix}$$

c)

$U \backslash V$	0	1	2	
0	$\frac{9}{36}$	0	0	$\frac{9}{36}$
1	$\frac{4}{36}$	$\frac{12}{36}$	0	$\frac{18}{36}$
4	$\frac{3}{36}$	0	$\frac{6}{36}$	$\frac{9}{36}$
	$\frac{16}{36}$	$\frac{14}{36}$	$\frac{6}{36}$	

6)

$$\left.\begin{array}{l} X \sim P(1) \\ Y \sim P(2) \end{array}\right\} Z = X + Y \sim P(3)$$

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$E(Z) = \lambda = 3$

$D(Z) = \lambda = 3$

7)

$$X \sim B(n,p) = B(100,p)$$

$$P(X=0) = (1-p)^{100} = 0,4954$$

$$p = 0.007$$

$$P(X \geq 3) = 1 - P(X=0) - P(X=1) - P(X=2)$$

$$= 1 - 0.4954 - \binom{100}{1} p^1 (1-p)^{99} - \binom{100}{2} p^2 (1-p)^{98}$$

$$= 0.0336$$

SA APROX

$$X \sim B(100, 0.007) \approx P(\underbrace{0.7}_{\lambda = n \cdot p})$$

$$P(X \geq 3) = 1 - P(X=0) - P(X=1) - P(X=2)$$

$$= 1 - e^{-0.7} - 0.7 e^{-0.7} - \frac{0.7^2}{2!} e^{-0.7} = 0,0341$$