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1.

$E(X)=-1\times\frac{1}{3}+0\times\frac{1}{6}+\frac{1}{2}\times\frac{1}{6}+\frac{1}{12}+\frac{1}{4}\times 2=\frac{1}{3}$

$E(-X+1)=(+1+1)\times\frac{1}{3}+(1\times\frac{1}{6})+(-\frac{1}{2}+1)\times\frac{1}{6}+0\times\frac{1}{12}+(-1)\times\frac{1}{4}=\frac{2}{3}$

$E(X^2)=1^2\times\frac{1}{3}+0\times\frac{1}{6}+\frac{1}{4}\times\frac{1}{6}+1\times\frac{1}{12}+4\times\frac{1}{4}=\frac{35}{24}$

2、$E((X-1)(X-2))=E(X^2-3X+2)=E(X^2)-3E(X)+E(2)=1$ 而 $E(X)=\lambda$, $E(X^2)-E(X)^2=\lambda$

$\therefore E(X^2)=\lambda+\lambda^2$

$\therefore \lambda^2-2\lambda+1=0 \quad \lambda=1.$

(3) 解法1：$g(x)=x_i^2$

$E(g(x_i))=|g(x_i)|p_i=\times C_{10}^{0}0.4^{0}\times(0.6)^{10}\cdots$

$=10\times C_{10}^{10}(0.4)^{10}\times(0.6)^{1}$

$=18.4$

解法2：$E(X)=np=4$

$D(X)=n(1-p)p=10\times0.4\times0.6=2.4$

$E(X^2)=D(X)+(E(X))^2=2.4+4^2=18.4$

10、

$E(X)=\int_0^{+\infty}xf(x)dx=\int_0^{+\infty}xe^{-x}dx=-e^{-x}x|_0^{+\infty}-(\int_0^{+\infty}e^{-x}dx)=(-x+1)e^{-x}|_0^{+\infty}=1$

$E(X^2)=\int_0^{+\infty}x^2f(x)dx=\int_0^{+\infty}2x e^{-x}dx=2E(X)=2$

$E(X+e^{-2X})=E(X)+E(e^{-2X})=1+\int_0^{+\infty}e^{-2x}f(x)dx=1+\int_0^{+\infty}e^{-3x}dx$

$=1+\frac{1}{3}e^{-3x}|_0^{+\infty}=1+\frac{1}{3}=\frac{4}{3}$

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$E(X)=0\times0.5+1\times0.5=\frac{1}{2}$

$E(Y)=0\times0.7+1\times0.3=0.3$

$E(X-2Y)=E(X)-2E(Y)=-0.1$

$E(3XY)=3E(XY)$ 设 $g(x_i,y_j)=x_iy_j$

$E(XY)=\sum_{ij}|g(x_i;y_j)|p_{ij}=0\times0.3+0\times0.2+0\times0.4+1\times1\times0.1=0.1$

$E(3XY)=0.3$