

胡博闻 2016121518

49.

$$P(2X+1=k)=\begin{cases} 0.1, & k=-1 \\ 0.2, & k=1 \\ 0.3, & k=3 \\ 0.4, & k=5 \end{cases}$$

$$p(X^2=k)=\begin{cases} 0.2, & k=0 \\ 0.4, & k=1 \\ 0.4, & k=4 \end{cases}$$

50.

$$F(x)=\begin{cases} 0 & x \leq 0 \\ 1-e^{-x} & x > 0 \end{cases}$$

$$\begin{aligned} G(y) &= P(Y \leq y) \\ &= P(X^2 \leq y) \\ &= P(X \leq \sqrt{y}) \\ &= F(\sqrt{y}) \end{aligned}$$

$$G(y)=\begin{cases} 0 & y \leq 0 \\ 1-e^{-\sqrt{y}} & y > 0 \end{cases}$$

$$P(Y)=\begin{cases} \frac{\sqrt{y}e^{-\sqrt{y}}}{2y} & y > 0 \\ 0 & y \leq 0 \end{cases}$$

55.

$$p(x)=\begin{cases} \frac{1}{2\pi} & x \in [0, 2\pi] \\ 0 & x \notin [0, 2\pi] \end{cases}$$

$$F(x)=\begin{cases} 0 & x \in (-\infty, 0) \\ \frac{x}{2\pi} & x \in [0, 2\pi] \\ 1 & x \in (2, +\infty) \end{cases}$$

$$\begin{aligned} G(y) &= P(Y \leq y) \\ &= P(\cos X \leq y) \\ &= P(\arccos y \leq X \leq 2\pi - \arccos y) \end{aligned}$$

$$G(y)=\begin{cases} 0 & y \in (-\infty, -1) \\ 1 - \frac{\arccos y}{\pi} & y \in [-1, 1] \\ 1 & y \in (1, +\infty) \end{cases}$$

$$p(y)=\begin{cases} \frac{1}{\pi\sqrt{1-y^2}} & y \in [-1, 1] \\ 0 & y \notin [-1, 1] \end{cases}$$