
Soluções da Folha Prática 5

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1. (a) e^{-3} No R: `dpois(0,3)`; (b) $\sum_{k=0}^{3} \frac{3^k}{k!} e^{-3}$ No R: `ppois(3,3)`; (c) $\sum_{k=5}^{+\infty} \frac{3^k}{k!} e^{-3}$ No R: `1-ppois(4,3)`
   (d) $\frac{\sum_{k=5}^{10} \frac{3^k}{k!} e^{-3}}{\sum_{k=5}^{+\infty} \frac{3^k}{k!} e^{-3}}$ No R: (`ppois(10,3) - ppois(4,3)`)/ (`1-ppois(4,3)`); (e) $K = 4$
2. Valor exato/Aproximação:
   i) 0.03782949/0.03783327
   ii) 0.9972315/0.9972306
   iii 0.9329235/0.932914
3. (a) 0.0988 (b) 0.0141
   (c) $f(k) = \begin{cases} e^{-0.6p} \frac{(0.6p)^k}{k!} & se \quad k \in \mathbb{N}_0 \\ 0 & se \quad c.c. \end{cases}$ (d) $Poisson(\lambda p)$
4. —
5. (a) 0.21; 0.0189 (b) 0.0002

Soluções da Folha Prática 6

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1. (a) $k = \frac{1}{2}$, $F(c) = \begin{cases} \frac{1}{2} e^{c} & se \quad c < 0 \\ 1 - \frac{1}{2} e^{-c} & se \quad c \geq 0 \end{cases}$
   (b) $\frac{1}{2}; \frac{1}{2}; 0; 0; \frac{1}{2}(1 - e^{-1}); \frac{1}{2}(1 - e^{-1}); \frac{1}{2}(1 - e^{-1}); \frac{1}{2}(1 - e^{-1}); 1 - e^{-1}$ (c) $Exp(1)$
2. (a) $F(c) = \begin{cases} 0 & se \quad c < -1 \\ c + \frac{1}{2}c^2 + \frac{1}{2} & se \quad -1 \leq c < 0 \\ c - \frac{1}{2}c^2 + \frac{1}{2} & se \quad 0 \leq c < 1 \\ 1 & se \quad c \geq 1 \end{cases}$ (b) $0; \frac{7}{8}; \frac{3}{8}; \frac{1}{8}; \frac{5}{9}$
3. (a) $0.4718; \frac{1}{2}; 0.0562; 0.1147$ (b) 0.1442
4. —
5. (a) 0.6827 (b) 0.9545 (c) 0.9973
6. 0.0455
7. (d)
8. (a) $F(c) = \begin{cases} 0 & se \quad c < 0 \\ 1 - e^{-\lambda c} & se \quad c \geq 0 \end{cases}$; $P(T > c) = \begin{cases} 1 & se \quad c < 0 \\ e^{-\lambda c} & se \quad c \geq 0 \end{cases}$ (b) —
   (c) $\frac{3e^{-4}}{3e^{-4} + e^{-2}}$

9. (a) $a=0; b=1; k=2; f(x)=\begin{cases} 0 & se \quad x\leq 0 \vee x\geq 2 \\ 1-\frac{x}{2} & se \quad 0<x<2 \end{cases}$ (b) $\frac{1}{16}$ (c) 0.0344 (d) 20kg

10. $Y \sim Exp(1)$

11. (a) $F(c)=\begin{cases} 0 & se \quad c<2 \\ \frac{c-2}{10} & se \quad 2\leq c\leq 12 \\ 1 & se \quad c>12 \end{cases}$ (b) $U([2,12])$ (c) 0.6; 0.1209

12. (a) 0.25 (b) 0.25 (c) 0.6 (d) 359ml

13. (a) 0.3935 (b) 0.3679 (c) 0.3935

14. (a) — (b) $H_1(t)=\begin{cases} 0 & se \quad t<-1 \\ 1 & se \quad t\geq -1 \end{cases}$ e $H_2(t)=\begin{cases} 0 & se \quad t<\frac{1}{2} \\ \frac{2t-1}{3} & se \quad \frac{1}{2}\leq t\leq 2 \\ 1 & se \quad t>2 \end{cases}$

15. $P(Y=0)=1-e^{-\lambda a}$, $F_Y(c)=\begin{cases} 0 & se \quad c<0 \\ 1-e^{-\lambda(c+a)} & se \quad c\geq 0 \end{cases}$

Soluções da Folha Prática 7

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1. —

2. (a)

	$E[X]$	$Var[X]$	σ_X	$\chi_{0.25}$	$\chi_{0.5}$	$\chi_{0.75}$
5. (a)	$\frac{70}{36}$	$\frac{2660}{1296}$	$\sqrt{\frac{2660}{1296}}$	1	2	3
5. (b)	$\frac{161}{36}$	$\frac{2555}{1296}$	$\sqrt{\frac{2555}{1296}}$	3	5	~~5~~
5. (c)	$\frac{91}{36}$	$\frac{2555}{1296}$	$\sqrt{\frac{2555}{1296}}$	1	2	3
5. (d)	1	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	0	1	1
5. (e)	1	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	0	1	1
5. (f)	7	$\frac{210}{36}$	$\sqrt{\frac{210}{36}}$	5	7	9
12	$\frac{3}{4}$	$\frac{11}{16}$	$\sqrt{\frac{11}{16}}$	0	0	1

(b)

	$E[X]$	$Var[X]$	σ_X	$\chi_{0.25}$	$\chi_{0.5}$	$\chi_{0.75}$
1.	0	2	$\sqrt{2}$	$-\log(2)$	0	$\log(2)$
2.	0	$\frac{1}{6}$	$\frac{1}{\sqrt{6}}$	$-1+\frac{\sqrt{2}}{2}$	0	$1-\frac{\sqrt{2}}{2}$
9.	$\frac{2}{3}$	$\frac{2}{9}$	$\frac{\sqrt{2}}{3}$	$2-\sqrt{3}$	$2-\sqrt{2}$	1

3. $E[Y]$ existe e $E[Y]=\frac{1-e^{-\lambda}}{\lambda}$

4. (a) $\frac{1}{2}$ (b) $Y\sim U([0,1])$, $E[Y]=\frac{1}{2}$ e $Var[Y]=\frac{1}{12}$

5. (a) $F(c)=\begin{cases} 0 & se \quad c<0 \\ 4c^3-3c^4 & se \quad 0\leq c\leq 1 \\ 1 & se \quad c>1 \end{cases}$; $E[X]=\frac{3}{5}$ e $Var[X]=\frac{1}{25}$

   (b) $E[L]=\frac{8v_1+\sout{40}v_2+33v_3}{81}-k$; $\sigma_L=\sqrt{\frac{8v_1^2+\sout{40}v_2^2+33v_3^3}{81}-\left(\frac{8v_1+\sout{40}v_2+33v_3}{81}\right)^2}$

6. —

7. —