

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)  $f(k) = \begin{cases} e^{-0.6p} \frac{(0.6p)^k}{k!} & \text{se } k \in \mathbb{N}_0 \\ 0 & \text{se } c.c. \end{cases}$  (d) *Poisson*( $\lambda p$ )

4. —

5. (a) 0.21; 0.0189 (b) 0.0002

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1. (a)  $k = \frac{1}{2}$ ,  $F(c) = \begin{cases} \frac{1}{2}e^c & \text{se } c < 0 \\ 1 - \frac{1}{2}e^{-c} & \text{se } c \geq 0 \end{cases}$   
(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)  $F(c) = \begin{cases} 0 & \text{se } c < -1 \\ c + \frac{1}{2}c^2 + \frac{1}{2} & \text{se } -1 \leq c < 0 \\ c - \frac{1}{2}c^2 + \frac{1}{2} & \text{se } 0 \leq c < 1 \\ 1 & \text{se } c \geq 1 \end{cases}$  (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)  $F(c) = \begin{cases} 0 & \text{se } c < 0 \\ 1 - e^{-\lambda c} & \text{se } c \geq 0 \end{cases}$ ;  $P(T > c) = \begin{cases} 1 & \text{se } c < 0 \\ e^{-\lambda c} & \text{se } c \geq 0 \end{cases}$  (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)  $F(c) = \begin{cases} 0 & c < 2 \\ \frac{c-2}{10} & 2 \leq c \leq 12 \\ 1 & c > 12 \end{cases}$  (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.  $P(Y = 0) = 1 - e^{-\lambda a}, \quad F_Y(c) = \begin{cases} 0 & se \quad c < 0 \\ 1 - e^{-\lambda(c+a)} & se \quad c \geq 0 \end{cases}$

#### Soluções da Folha Prática 7

1. —

2. (a)

	$E[X]$	$Var[X]$	$\sigma_X$	$\chi_{0.25}$	$\chi_{0.5}$	$\chi_{0.75}$
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)

	$E[X]$	$Var[X]$	$\sigma_X$	$\chi_{0.25}$	$\chi_{0.5}$	$\chi_{0.75}$
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)  $E[L] = \frac{8v_1+40v_2+33v_3}{81} - k; \sigma_L = \sqrt{\frac{8v_1^2+40v_2^2+33v_3^2}{81} - \left(\frac{8v_1+40v_2+33v_3}{81}\right)^2}$

6. —

7. —