

## SOLUÇÕES DOS EXERCÍCIOS PROPOSTOS

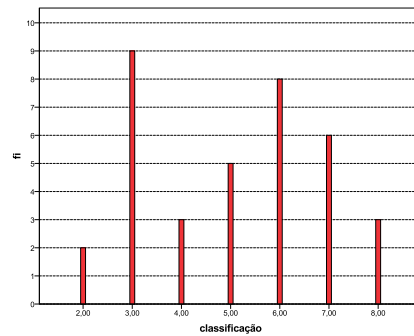
### FICHA N°1 - DESCRITIVA

1.

a) Variável discreta ordinal

b)  $\bar{x} = 5.056$  ;  $s = 1.8197$  ; c)

Mediana=5.0; moda =3

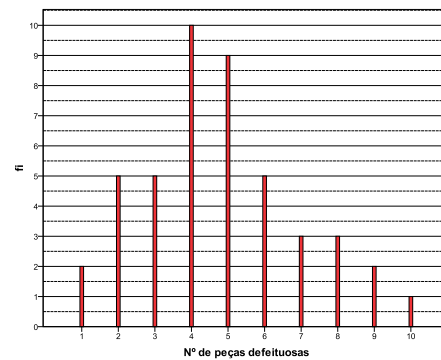


2.

a) Variável discreta

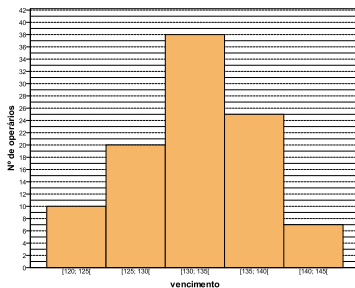
c)  $\bar{x} = 4.78$   $s^2 = 4.677$   
Mediana=5.0; moda =4

b)



3.

a)



b)

$\bar{x} = 132.45$   $s = 5.34$   
Mediana=132.6; moda  
=132.9

c)(i) 68 (ii) 95

4.

a)

| xi    | fi  | fri (%) | Fri (%) |
|-------|-----|---------|---------|
| 422   | 2   | 2       | 2       |
| 427   | 5   | 5       | 7       |
| 432   | 6   | 6       | 13      |
| 437   | 14  | 14      | 27      |
| 442   | 18  | 18      | 45      |
| 447   | 27  | 27      | 72      |
| 452   | 19  | 19      | 91      |
| 457   | 8   | 8       | 99      |
| 462   | 1   | 1       | 100     |
| Total | 100 | 100     |         |

b)  $\bar{x} = 444.2$  ,  $s = 8.5$

c) 28%

5.

a)  $\bar{x} = 831.2$  , Med=830.59, Mod=830,  $s^2 = 647.85$

b) 32%

c) 86%

### FICHA N°2 - PROBABILIDADES

1. a) sim b) não c) 0.3077

2. a) 5/6 b) 1/6

3. a) 2/9 b) 5/12

4. a) 1/3 b) 1/6 c) 1/3 d) 5/6

5. a) 1/6 b) 1/2 c) 1/12 d) 9/12

6. a) 1/24 b) 9/24 c) 5/8 d) 1/8

7. a) 3/4 b) 3/4 c) 1/3 d) 1/4 e) 2/3 f) 1/4 g) 3/4 h) 1/3

8. 0.75

9. 1/7

10. 1/13

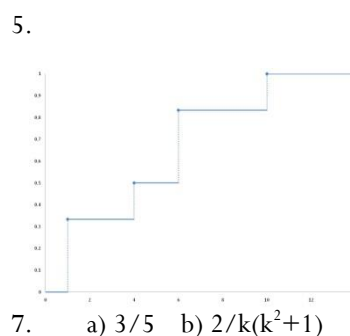
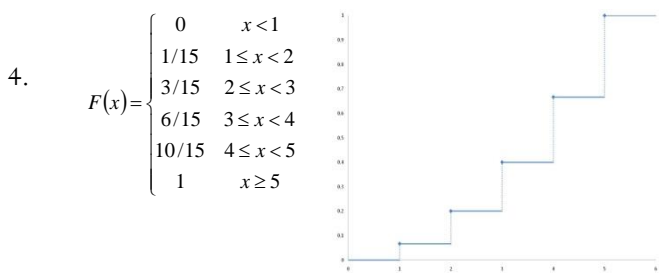
11. a) falha humana=1/2, falha travões=rebentamento pneu=1/4

b) 0.9524

12. 0.4545

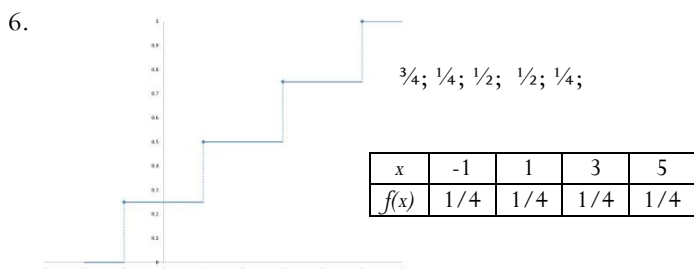
13. a) 0.5

## FICHA Nº 3 - DISTRIBUIÇÕES DE PROBABILIDADE



- a)  $\frac{1}{2}$   
b)  $\frac{1}{6}$   
c)

| x    | 1   | 4   | 6   | 10  |
|------|-----|-----|-----|-----|
| f(x) | 1/3 | 1/6 | 1/3 | 1/6 |



7. a)  $\frac{3}{5}$  b)  $\frac{2}{k(k^2+1)}$

8. b)  $\frac{4}{5}$

c) 
$$F(x) = \begin{cases} 0 & \text{se } x \leq 2 \\ \frac{1}{5}(x-2) & \text{se } 2 < x < 7 \\ 1 & \text{se } x \geq 7 \end{cases}$$

9. a) 0.54; 0.1519 b) 
$$F(x) = \begin{cases} 0 & \text{se } x \leq 2 \\ \frac{x^2}{16} + \frac{x}{8} - \frac{1}{2} & \text{se } 2 < x < 4 \\ 1 & \text{se } x \geq 4 \end{cases}$$

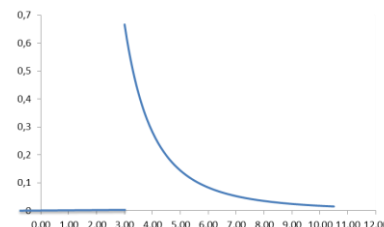
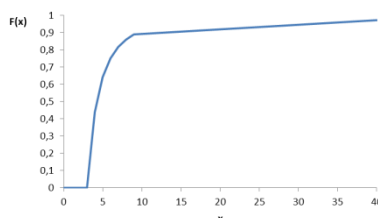
10. a)  $\frac{1}{4}$  b)  $\frac{1}{4}; \frac{1}{2}$  c) 
$$F(x) = \begin{cases} 0 & \text{se } x \leq 0 \\ \frac{1}{2}\sqrt{x} & \text{se } 0 < x < 4 \\ 1 & \text{se } x \geq 4 \end{cases}$$

11. k = 2

12. a) k=6 b) 0,15625; 0.5 c) 
$$F(x) = \begin{cases} 0 & \text{se } x \leq 0 \\ 6\left(\frac{x^2}{2} - \frac{x^3}{3}\right) & \text{se } 0 < x < 1 \\ 1 & \text{se } x \geq 1 \end{cases}$$

13.  $\frac{1}{2}; 0; f(x) = \begin{cases} \frac{1}{2} & -1 < x < 1 \\ 0 & \text{outros valores} \end{cases}$

14. 0.64 e 0.859 
$$f(x) = \begin{cases} \frac{18}{x^3}, & x > 3 \\ 0, & x \leq 3 \end{cases}$$



## FICHA Nº 4 – ESPERANÇA MATEMÁTICA

- 1/7; 1.837
- 3.08; 0.347
- 1; 1/6
- a) 3.67; 15; 1.531 b) 183.04
- a) 1.8205; 3.641; 7.889; 0.327 b) 10.7095

## FICHA Nº 5 – FAMÍLIAS DE DISTRIBUIÇÕES

- a) 0.1901 b) 0.0113 c) 0.3917
- a) 0.2463 b) 0.8593 c) 3.2
- a) 0.0198 b) 0.9510 c) 2 d) 1.407
- a) 0.9 b) 0.99 c) 0.999
- a) 0.7625 b) 0.8867 c) 0.6492
- a) 0.0821 b) 0.0653 c) 0.384
- a) 0 b) 0.997 c) 0.0821 d) 0.9179
- a) 0.034 b) 5
- a) 0.2231 b) 0.066 c) 0.2525
- a) 3.6 b) 0.874 c) 0.2125

11. a) 0.1667 b) 0.67
12. 20%
13. a) 0.3297 b) 0.2387
14. a) 0.6065 b) 0.5276
15. a) 0.181 b) 0.2231
16. a) 0.1056 b) 0.3372 c) 0.7492
17. a) 0.0918 b) 27 meses
18. a) 0.1056 b) 11.632 min. c) 11:15
19. a) 0.0668 b) 0.0062 c) 0.9198
20. a) 0.1056 b) 0.0062 c) 0.5934
21. a) 8.8%, 40.82%, 40.82%, 8.8%, 0.38% b) 11 pares
22. 0.0104
23. a) 0.0386 b) 0.0823 c) 0.8731
24. a) 0.0786 b) 0.1423

#### FICHA Nº 6 – ESTIMADORES PONTUAIS

1.  $t_r(\theta^2) = 0$
2. a)  $W_1, W_3$  b)  $\text{var}[W_1] = \frac{3}{8}\sigma^2$ ,  $\text{var}[W_3] = 0.34\sigma^2$  c)  $ef(W_1, W_3) = 1.103$
3.  $T_1$
4. a) Sim b)  $n_1 > \frac{3}{4}n$
5. a)  $\frac{\theta+1}{3}$  b) Não

#### FICHA Nº 7 - DISTRIBUIÇÕES AMOSTRAIS

1. a) 325 b) 2 c) 0.0606 d) 0.8186 e) 0.1587 f) 0.0668
2. a) 0.0132 b) 0.1335 c) 0.6648
3. 0.0244
4. a) 0.8258 b) 0.8315
5. a) 4 b) 0.0456

#### FICHA Nº 8 - INTERVALOS DE CONFIANÇA

1. a)  $64.3 \pm 6.57$  b)  $64.3 \pm 5.53$
2. a)  $2.28 \pm 0.56$  b) (90%)  $2.28 \pm 0.32$ , (95%)  $2.28 \pm 0.40$
3.  $177500 \pm 1764$
4. a)  $45 \pm 2.08$  b)  $45 \pm 1.47$  c)  $45 \pm 1.20$
5. 136
6. ]-4.21, 84.21[
7. a)  $330 \pm 488.7$  b)  $330 \pm 270.95$
8. a)  $-1.2 \pm 2.58$  b) 2.58
9. a) 0.28 b) 0,05668
10.  $0.082 \pm 0.024$
11.  $0.2 \pm 0.064$
12. a) 0.58 b)  $0.58 \pm 0.125$ ,
13. a)  $0.35 \pm 0.039$  b) (95%)  $0.35 \pm 0.047$ , (98%)  $0.35 \pm 0.056$
14.  $-0.27 \pm 0.120$
15.  $0.065 \pm 0.0354$
16. ]2.92, 6.58[
17. ]0.000851, 0.0043[
18. ]0.163, 0.918[

#### FICHA Nº 9 - TESTES HIPÓTESES

1.  $n=39$ ,  $k=1.32$
2. a)  $\alpha=0.5$  b)  $\beta=0.3$
4. a) i)  $\alpha=0.3$ ,  $\beta=0.8$  ii)  $\alpha=0.3$ ,  $\beta=0.6$  b) C2
5. a) 0.0559 b) administração
6. b) ponto crítico 0.30256
7. a)  $\alpha=0.0361$

| p                  | 0.05   | 0.10   | 0.15   | 0.20   | 0.25   | 0.30   | 0.35   | 0.40   |
|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| b) função potência | 0.0361 | 0.1841 | 0.3958 | 0.6020 | 0.7639 | 0.8732 | 0.9383 | 0.9729 |

8. a) 0.8518

|          |        |        |        |        |        |        |        |
|----------|--------|--------|--------|--------|--------|--------|--------|
| $\theta$ | 2      | 4      | 6      | 8      | 12     | 16     | 20     |
| $\beta$  | 0.0158 | 0.0855 | 0.1283 | 0.1447 | 0.1455 | 0.1342 | 0.1215 |

b)

|          |        |       |        |        |
|----------|--------|-------|--------|--------|
| $\mu$    | 37     | 38    | 39     | 40     |
| $\alpha$ | 0,0006 | 0,003 | 0,0122 | 0,0401 |

9. a)

|         |         |        |        |        |        |        |        |        |
|---------|---------|--------|--------|--------|--------|--------|--------|--------|
| $\mu$   | 41      | 42     | 43     | 44     | 45     | 46     | 47     | 48     |
| $\beta$ | 0,08944 | 0,7734 | 0,5987 | 0,4013 | 0,2266 | 0,1056 | 0,0401 | 0,0122 |

b)

10. a) depende do valor de prova b) Sim

11. a) Não b) Sim c) Sim

12.  $Z=2.65$ , Rej.

13.  $Z=4.78$  Rej.

14.  $T= -0.51$  N.Rej.

15.  $T= -2.11$  Rej.

16.  $T=0.99$  N.Rej.

17.  $T=4.033$  Rej.

18.  $Z=-3.84$  Rej.

19.  $Z=1.08$  N.Rej.

20.  $Z=4.82$  Rej

21.  $Z=2.60$ , Rej.

22.  $Z=2.021$  Rej

23.  $Z=-1.55$  N.Rej

24.  $Z=-2.0$  N.Rej.

25.  $Z= -2.5$ , Rej.

26.  $Q=32.11$  Rej

27.  $Q=5.92$  N.Rej.

28.  $F=5.49$  Rej

#### FICHA Nº 10 – ANÁLISE DA VARIÂNCIA

1. a)  $F=8.42$  Rej, b)  $0.96 \pm 0.503$

2.  $F=12.45$  Rej

3.  $F=12.11$  Rej

4.  $F=39.3$  Rej

5. a)  $F1=51.67$  Rej b)  $F2=23$  Rej

6. b)  $F1=4.25$  N.Rej,  $F2=4.90$  N.Rej

7.  $F1=7.76$  Rej,  $F2=8.07$  Rej

#### FICHA Nº 11 – QUI-QUADRADO

1.  $Q=35$  Rej

2.  $Q=8.46$  Rej

3.  $Q=20$  a) Rej b) Rej

4.  $Q=29.16$  Rej

5.  $Q=1.4$  N.Rej

6.  $Q=10.502$  Rej

7.  $Q=21.892$  Rej

8.  $Q=13.6$  Rej

9. b) 0.0179, 0.1178, 0.3245, 0.3557, 0.1554, 0.0268, 0.0019 c)  $Q=1.45$  N.Rej.

#### FICHA Nº 12 – REGRESSÃO E CORRELAÇÃO

1. a) 1.184, b)  $1.184 \pm .248$ , c)  $T1=1.51$  N.Rej, d)  $r=0.845$ , [0.698, 1.068], e)  $E[Y_0] = 1.357$

2.  $\hat{Y}_i = 51.27 + 1.518X_1 + 0.675X_2$

3.  $\hat{Y}_i = 101.36 - 2.3577X_i + 0.0187X_i^2 - 5E^{-05}X_i^3$

4.  $k_1=170608$ ,  $k_2=-2.057$

5. a)  $\hat{Y}_i = 3.471 - 0.088X_i$  b)  $T= 57.738$  Rej. c)  $r^2=0.981$  d)  $[-0.100, -0.076]$

6. SPSS ou Excel

7. a)  $\hat{Y}_i = -124.57 + 1.659*QI + 1.439*Horas$  b) 63.26

8.  $r=0.743$

9. SPSS ou Excel

10.  $R = -0.334$  N.Rej