

## Teste Março 2008 11º 62

### Resolução

1)  $\lambda=4$  10 min.

$$1.1) P(X=6) = e^{-4} \times \frac{4^6}{6!} = 0.104195\dots$$

1.2) 15 minutos  $\lambda=6$

$$1 - [P(0) + P(1) + P(2) + P(3) + P(4)] = 1 -$$

$$[0.0024787 + 0.014872 + 0.044617 + 0.089235 + 0.13385] = 0.7149473$$

$$1.3) \lambda=8 \quad P(X=0) = e^{-8} \times \frac{8^0}{0!} = 0.0003354$$

2) 6P 4B Total 10

$$P(P)=0.6 \quad P(B)=0.4$$

$$2.1) E(X) = \frac{1}{0.4} = 2.5$$

$$2.1.1) P(B,B,P) = 0.4 * 0.4 * 0.6 = 0.096$$

$$2.2.2) P(P,P,P,P,P,P,B) = 0.6^6 * 0.4 = 0.0186624$$

3) [30, 70]

$$3.1) \frac{30+70}{2} = 50 \text{ min}$$

$$3.2.1) \frac{20}{40} = \frac{1}{2}$$

$$3.2.2) \frac{59-42}{40} = \frac{17}{40} = 0.425$$

$$3.2.3) \frac{66-30}{40} = \frac{36}{40} = 0.9$$

$$4) \text{Exp. } E(X)=17 \quad \frac{1}{\lambda} = 17 \quad \text{logo: } \lambda = \frac{1}{17}$$

$$4.1) \lambda = \frac{1}{17} = 0.058823\dots$$

$$4.2.1) P(X>9) = 1 - P(X \leq 9) = 1 - P(0 \leq X \leq 9) = 1 - \left( e^{-\frac{1}{17} \times 0} - e^{-\frac{1}{17} \times 9} \right) = 1 - \left( e^0 - e^{-\frac{9}{17}} \right) =$$

$$= 1 - (1 - e^{-9/17}) = 0.58891$$

$$4.2.2) P(5 < X < 12) = e^{-\frac{1}{17} \times 5} - e^{-\frac{1}{17} \times 12} = 0.2515160$$

$$5) P(X=0) = 6/36 = 1/6 \quad P(X=1) = 10/36 = 5/18 \quad P(X=2) = 8/36 = 2/9 \quad P(X=3) = 6/36 = 1/6$$

$$P(X=4) = 4/36 = 1/9 \quad P(X=5) = 2/36 = 1/18$$

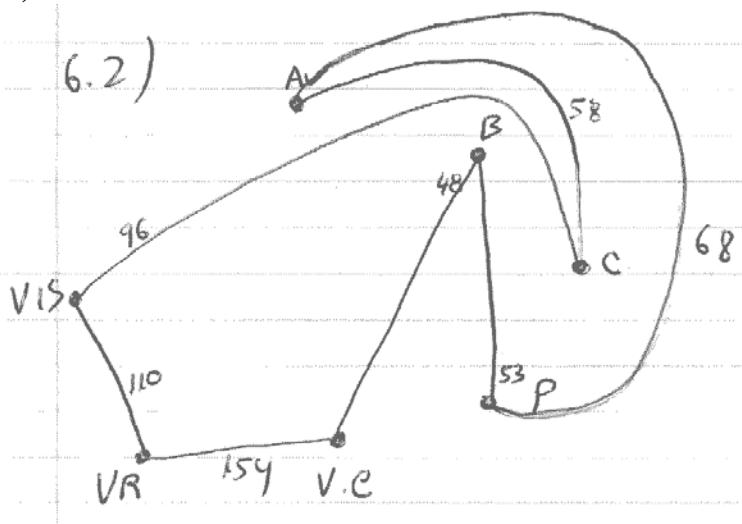
<b>Xi</b>	0	1	2	3	4	5
<b>Pi</b>	1/6	5/18	2/9	1/6	1/9	1/18

$$5.2) E(X) = 0 \times \frac{1}{6} + 1 \times \frac{5}{18} + 2 \times \frac{2}{9} + 3 \times \frac{1}{6} + 4 \times \frac{1}{9} + 5 \times \frac{1}{18} = 1.9444$$

$$\sigma = \sqrt{(0-1.9444)^2 \times \frac{1}{6} + (1-1.9444)^2 \times \frac{5}{18} + \dots + (5-1.9444)^2 \times \frac{1}{18}} = 1.432644\dots$$

6.1) P—53—B—48—VC—142—AV—58—Coim—96—Vis—110—VR—116—P  
Total :623

6.2)



P—AV—C—Vis—VR—VC—B—P total 587

7) 1500	500	10° ano	20% = 0.2
	400	11° ano	30% = 0.3
	600	12° ano	25% = 0.25

$$7.1) P(D) = P(D/10^\circ) \cdot P(10^\circ) + P(D/11^\circ) \cdot P(11^\circ) + P(D/12^\circ) \cdot P(12^\circ) = 0.2 \times \frac{500}{1500} + 0.3 \times \frac{400}{1500} + 0.25 \times \frac{600}{1500} = 0.2466$$

$$7.2) 1 - 0.2466 = 0.7534$$

$$7.3) 0.2$$

$$7.4) P(10^\circ / D) = \frac{P(D/10^\circ) \times P(10^\circ)}{P(D)} = \frac{0.2 \times \frac{1}{3}}{0.2466} = 0.27034$$