

Carolina Ferreira e Matheus Coqueirinha

Q1

chegam 20 clientes/h atendem 26 clientes/h

$$\lambda = 20 \text{ cli/h}$$

$$\mu = 26 \text{ cli/h}$$

1)

$$P_1 = P_0 \times (\lambda / \mu) = 1 \cdot 0,7692 = 0,7692$$

$$P_2 = 0,7692 \cdot 0,7692 = 0,5916$$

$$P_3 = 0,5916 \cdot 0,7692 = 0,4551$$

$$P_4 = 0,4551 \cdot 0,7692 = 0,3500$$

$$P_5 = 0,35 \cdot 0,7692 = 0,2682$$

$$P_6 = 0,2682 \cdot 0,7692 = 0,2071$$

$$P_7 = 0,2071 \cdot 0,7692 = 0,1593$$

$$P_8 = 0,1593 \cdot 0,7692 = 0,1225$$

$$P_9 = 0,1225 \cdot 0,7692 = 0,0942$$

$$P_{10} = 0,0942 \cdot 0,7692 = 0,0725$$

$$P_{11} = 0,0725 \cdot 0,7692 = \underline{\underline{0,0557}}$$

(Q2)

$$1) \lambda = 5 \text{cli/h} \quad N = 2 \text{cli/h} : \mu_2 = 4 \quad \mu_3 = 6$$

$$W_1 = 1 \cdot \frac{5}{2} = 2,5$$

~~$$W_1 = 2,5 \cdot \frac{5}{4} =$$~~

$$W_2 = 2,5 \cdot \frac{5}{4} = 3,125$$

$$W_3 = 3,125 \cdot \frac{5}{6} = 2,6041$$

$$W_4 = 2,6041 \cdot \frac{5}{6} = 2,1700$$

~~$$\sum = 9,2291 + 2,1700 = 11,3991$$~~

$$\pi_0 = 1/11,3991 = 0,0877$$

$$\pi_1 = 2,5/11,3991 = 0,2193$$

$$\pi_2 = 3,125/11,3991 = 0,2741$$

$$\pi_3 = 2,6041/11,3991 = 0,2284$$

$$\pi_4 = 2,17/11,3991 = 0,1903$$

$$\text{Perda} = 5 \cdot 0,1903 = 0,9515 \text{ cli/h}$$

$$2) W = \frac{N}{D} = \frac{2,1739}{4,0472} = 0,5470 = \underline{\underline{32,82}} \text{ minutos}$$

$$N = (0 \cdot 0,0877) + (1 \cdot 0,2193) + (2 \cdot 0,2741) + (3 \cdot 0,2284) + (4 \cdot 0,1903) =$$

$$N = 0,2193 + 0,5482 + 0,6852 + 0,7612 = 2,2139$$

$$D = (0 \cdot 0,0877) + (2 \cdot 0,2193) + (4 \cdot 0,2741) + (6 \cdot 0,2284) + (6 \cdot 0,1903) =$$

$$D = 0,9386 + 1,0969 + 1,3704 + 1,1918 = 4,0972$$