Prova
Vinicius Mosquini 0093/19

1-) $n = 4$ $p = 1/6$
$x = 3$ $q = 5/6$

$p(x) = \binom{N}{x} \cdot p^x \cdot q^{n-x}$

$p(3) = \binom{4}{3} \cdot \left(\frac{1}{6}\right)^3 \cdot \left(\frac{5}{6}\right)^1$

$\binom{4}{3} = \frac{4!}{3!(4-3)!}$

$\frac{4!}{3!\,1!} = \frac{4 \cdot \cancel{3!}}{\cancel{3!}} = 4$

$p(3) = 4 \cdot \frac{1}{216} \cdot \frac{5}{6} = \frac{20}{1296}$

$p(3) = 0{,}0154$
$\boxed{1{,}54\%}$

2-) $n = 10$ $p = 25\% = 0{,}25$
$x \leq 1 = 0, 1$ $q = 75\% \; 0{,}75$

$p(0) = \binom{10}{0} \cdot 0{,}25^0 \cdot 0{,}75^{10}$

$\binom{10}{0} = \frac{10!}{0!(10-0)!} = \frac{10!}{1!\,10!} = 1$

$p(0) = 1 \cdot 1 \cdot 0{,}0563 \cong 0{,}0563$

$\binom{10}{1} = \frac{10!}{1!(10-1)!} = \frac{10!}{1!\,9!} = \frac{10 \cdot \cancel{9!}}{1!\,\cancel{9!}} = 10$

$p(1) = \binom{10}{1} \cdot 0{,}25^1 \cdot 0{,}75^9$

$p(1) = 10 \cdot 0{,}25 \cdot 0{,}0751 \cong 0{,}1878$

$p(x \leq 1) = p(0) + p(1) = 0{,}0563 + 0{,}1878 \cong 0{,}2441$

$\boxed{\cong 24{,}41\%}$

3-) $n = 15$ $\quad p = 15\% = 0,15$

$X = 4$ $\quad q = 85\% \quad 0,85$

$$P(4) = \binom{15}{4} \cdot 0,15^{4} \cdot 0,85^{11}$$

$$\binom{15}{4} = \frac{15!}{4!(15-4)!} = \frac{15!}{4!\,11!}$$

$$\frac{15 \cdot 14 \cdot 13 \cdot 12 \cdot \cancel{11!}}{4!\,\cancel{11!}} = \frac{32.760}{24}$$

$1365$

$$P(4) = 1365 \cdot 0,0005 \cdot 0,1673 \cong 0,1142$$

$\boxed{11,42\%}$ //

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4-) $\dfrac{3+9}{2} = \dfrac{12}{2} = 6$ mes/30 días

$2$ 10 días $\quad n = 2 \quad e = 2,718$

$$P(3) = \frac{2^{3}}{2,718^{2} \cdot 3!} = \frac{8}{7,3875 \cdot 6} = \frac{8}{44,325} \cong 0,1805$$

$\boxed{18,05\%}$ //

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5-) $\lambda = 25,9/7 \qquad K = 5$

$\lambda = 3,7$

$$P(5) = \frac{3,7^{5}}{2,718^{3,7} \cdot 5!} = \frac{693,4396}{40,4318 \cdot 120} = \frac{693,4396}{4851,816} = 0,1429$$

$$\boxed{\cong 14,29\%}$$

6.) $\lambda = 6$ $\quad K \leq 3 \begin{cases} 0 \\ 1 \\ 2 \\ 3 \end{cases}$

$$P(0) = \frac{6^0}{2{,}718^6 \cdot 0!} = \frac{1}{403{,}1779 \cdot 1} = \frac{1}{403{,}1779} \cong 0{,}0025$$

$$P(1) = \frac{6^1}{2{,}718^6 \cdot 1!} = \frac{6}{403{,}1779} \cong 0{,}0149$$

$$P(2) = \frac{6^2}{2{,}718^6 \cdot 2!} = \frac{36}{403{,}1779 \cdot 2} = \frac{36}{806{,}3558} \cong 0{,}0446$$

$$P(3) = \frac{6^3}{2{,}718^6 \cdot 3!} = \frac{216}{403{,}1779 \cdot 6} = \frac{216}{2.419{,}0674} \cong 0{,}0893$$

$$P(0) + P(1) + P(2) + P(3)$$

$$0{,}0025 + 0{,}0149 + 0{,}0446 + 0{,}0893 \cong 0{,}1513$$

$$\boxed{\cong 15{,}13\%}$$

7-)

$$f(x) \begin{cases} C(x^2-1), \text{ se } -2 \leq x \leq 2 \\ 0, \text{ caso contrario} \end{cases}$$

$$\int_{-2}^{2} C(x^2-1)dx = C\int_{-2}^{2} x^2-1 =$$

$$= C\left(\frac{x^3}{3}\Big|_{-2}^{2} - x\Big|_{-2}^{2}\right) =$$

$$C\left(\frac{2^3}{3} - \frac{-2^3}{3} - (2-(-2))\right) =$$

$$C\left(\frac{8}{3} - \left(\frac{-8}{3}\right) - (2+2)\right) =$$

$$C\left(\frac{16}{3} - \frac{4}{1}\right) = C.\frac{16-12}{3} = C.\frac{4}{3}$$

$$C\frac{4}{3} = 1 \Rightarrow 4C = 1.3$$

$$4C = 3$$

$$\Rightarrow \boxed{C = \frac{3}{4}}$$

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8-)

$$f(x)\begin{cases} 0 \text{ se } x < 0 \\ 2x - 1/x \text{ se } x \geq 0 \end{cases}$$

$$\int_1^3 2x - \frac{1}{x}$$

$$2\int_1^3 x - \frac{1}{x} = 2\left(\frac{x^2}{2}\Big|_1^3 - \ln x\Big|_1^3\right) =$$

$$= 2\left(\frac{3^2}{2} - \frac{1^2}{2} - (\ln 3 - \ln 1)\right) =$$

$$= 2\left(\frac{9}{2} - \frac{1}{2} - (1{,}0986 - 0)\right) =$$

$$= 2\left(\frac{8}{2} - 1{,}0986\right) = 2\,(4 - 1{,}0986)$$

$$= 2 \cdot 2{,}9014 = \boxed{5{,}8028}$$