ALUNO: João Pedro Menezes Silva
TURMA: Engenharia Civil

Semana 7 - Exercício 4

Dados:
8 B (Bolas Brancas)
4 P (Bolas Pretas)
2 L (Bolas Laranjas)

+$2 para cada P sorteada
−$1 para cada B sorteada

X = "ganho com a retirada de 2 bolas da urna".

$\Omega = \{ \overset{-2}{(B,B)}; \overset{+1}{(B,P)}; \overset{-1}{(B,L)}; \overset{+1}{(P,B)}; \overset{+4}{(P,P)}; \overset{+2}{(P,L)}; \overset{-1}{(L,B)}; \overset{+2}{(L,P)}; \underset{0}{(L,L)} \}$. → cada evento elementar será dado por w_i, $1 \leq i \leq 9$.

a) $\boxed{X \in \{-2, -1, 0, 1, 2, 4\}.}$

b) TOTAL DE BOLAS = 14

$$P(W_1) = \frac{8}{14} \cdot \frac{7}{13} = \frac{28 \div 7}{91 \div 7} = \frac{4}{13}$$

$$P(W_2) = \frac{8}{14} \cdot \frac{4}{13} = \frac{16}{91}$$

$$P(W_3) = \frac{8}{14} \cdot \frac{2}{13} = \frac{8}{91}$$

$$P(W_4) = \frac{4}{14} \cdot \frac{8}{13} = \frac{16}{91}$$

$$P(W_5) = \frac{4}{14} \cdot \frac{3}{13} = \frac{6}{91}$$

$$P(W_6) = \frac{4}{14} \cdot \frac{2}{13} = \frac{4}{91}$$

$$P(W_7) = \frac{2}{14} \cdot \frac{8}{13} = \frac{8}{91}$$

$$P(W_8) = \frac{2}{14} \cdot \frac{4}{13} = \frac{4}{91}$$

$$P(W_9) = \frac{2}{14} \cdot \frac{1}{13} = \frac{1}{91}$$

$$P(X=-2) = P(W_1) = \boxed{\frac{4}{13}} \qquad P(X=4) = P(W_5) = \boxed{\frac{6}{91}}$$

$$P(X=-1) = P(W_3) + P(W_7) = \frac{8}{91} + \frac{8}{91} = \boxed{\frac{16}{91}}$$

$$P(X=0) = P(W_9) = \boxed{\frac{1}{91}}$$

$$P(X=1) = P(W_2) + P(W_4) = \frac{16}{91} + \frac{16}{91} = \boxed{\frac{32}{91}}$$

$$P(X=2) = P(W_6) + P(W_8) = \frac{4}{91} + \frac{4}{91} = \boxed{\frac{8}{91}}$$

FDP:

$$f(x) = \begin{cases} \frac{4}{13}, \text{ se } x = -2 \\ \frac{16}{91}, \text{ se } x = -1 \\ \frac{1}{91}, \text{ se } x = 0 \\ \frac{32}{91}, \text{ se } x = 1 \\ \frac{8}{91}, \text{ se } x = 2 \\ 0, \text{ caso contrário} \end{cases}$$

FDA:

$$F(x) = \begin{cases} 0, \text{ se } x < -2 \\ \frac{4}{13}, \text{ se } -2 \leq x < -1 \\ \frac{44}{91}, \text{ se } -1 \leq x < 0 \\ \frac{45}{91}, \text{ se } 0 \leq x < 1 \\ \frac{11}{13}, \text{ se } 1 \leq x < 2 \\ 1, \text{ se } x \geq 2 \end{cases}$$

gráfico FDP:

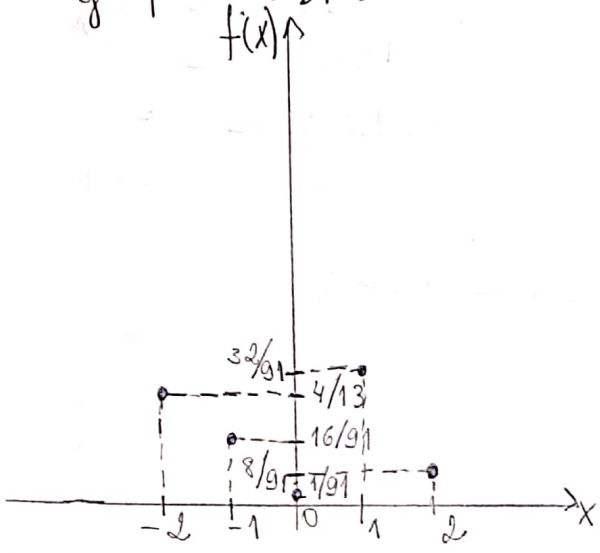

gráfico FDA: