3.1

$$X \sim \begin{pmatrix} -1 & 0 & 1 & 2 & 3 \\ 0,1 & 0,2 & 0,2 & 0,2 & 0,3 \end{pmatrix} \sim \Gamma(x \cdot y)$$

$$E(X) = 2 = \sum_x x \cdot P(X = y) = -1 \cdot 0,1 + 0 \cdot 0,2 + 1 \cdot 0,2 + 2 \cdot 0,2 + 3 \cdot 0,3 = 1,4$$

D(x) =

1. NAČIN

$$E(X^2) = \sum_x x^2 \cdot P(X=x) = (-1)^2 \cdot 0,1 + 0^2 \cdot 0,2 + 1^2 \cdot 0,2 + 2^2 \cdot 0,2 + 3^2 \cdot 0,5 = 5,8$$

2. NAČIN:

možemo domena x^2

$$X^2 \sim \begin{pmatrix} 1 & 0 & 1 & 4 & 9 \\ 0,1 & 0,2 & 0,2 & 0,2 & 0,3 \end{pmatrix} \sim \begin{pmatrix} 0 & 1 & 4 & 9 \\ 0,2 & 0,5 & 0,2 & 0,3 \end{pmatrix}$$

$$D(X) = E[(x - E(x))^2] = E(x^2) - E(x)^2$$

$$= 3,8 - 1,4^2 = 1,84$$

$$\sigma(x) = \sqrt{D(x)} = 1,36$$

3.2

$$E(X) = \int x \cdot f(x) \, dx = \ldots = \frac{5}{24}$$

$$f_X(x) = \begin{cases} 6x+2 & , \ 0 \le x \le \frac{1}{3} \\ 0 & , \ inače \end{cases}$$

$$E(X^2) = \int x^2 \cdot f_X(x) \, dx = \int x^2(6x+2) \, dx = \int_0^{\frac{1}{3}} 6x^3 + 2x^2 \, dx = 6\int_0^{\frac{1}{3}} x^3 \, dx + \int_0^{\frac{1}{3}} x^2 \, dx =$$

$$= 6\left(\frac{x^4}{4}\right)\Big|_0^{\frac{1}{3}} + 2\left(\frac{x^3}{3}\right)\Big|_0^{\frac{1}{3}} = \ldots = \frac{7}{162}$$

$$D(X) = E(X^2) - E(X)^2 = \frac{7}{162} - \left(\frac{5}{24}\right)^2 = \ldots = \frac{13}{1958}$$

$$\sigma(x) = \sqrt{D(x)} = $$

3.3

$X \sim$ Eljednol Enabasem $[a, b]$

$$f_X(x) = \begin{cases} \frac{1}{b-a} & , \ a \le x \le b \\ 0 & , \ inače \end{cases}$$

$$E(X) = \int x \cdot f_X(x) = \int_a^b x \cdot \frac{1}{b-a} = \frac{1}{b-a} \cdot \frac{x^2}{2}\Big|_a^b =$$

$$= \ldots = \frac{1}{2} \cdot \frac{1}{b-a} \cdot (b-a)(b+a) = \frac{b+a}{2}$$

$$E(X^2) = \int x^2 \cdot f_X = \frac{1}{b-a} \cdot \frac{x^3}{3}\Big|_a^b = \frac{1}{b-a} \cdot \frac{1}{3} \cdot (b^3 - a^3) = \frac{1}{3} \cdot \frac{1}{b-a}(b^3 - a^3)$$

$$= \ldots = \frac{b^2 + ab + a^2}{3}$$