Chapter VI

Parameters of a Random Variable

Exercises

6. 1.
Let the random variable X have the probability function

x_i	-3	0	1	2	3
$P(X = x_i)$	0.1	0.15	0.1	0.25	0.4

Find
a) the distribution function of X.
b) $P(X > 0)$.
c) the expected value and the dispersion of X.

6. 2.
An apparatus comprises 3 sensitive elements. Let p_i, $(i = 1, 2, 3)$, denote the probability that the ith element falls out.
Find the expected value of the number of elements that will fall out.

6. 3.
Consider the function f with

$$f(x) = \begin{cases} \alpha x^2(1-x) & 0 \le x \le 1 \\ 0 & \text{otherwise} \end{cases}.$$

a) For what value of α will f be the density function of a random variable X?
b) Find the distribution function, the expected value and the dispersion of X.
c) Determine $P(X < \frac{1}{2})$ and $P(X < E(X))$.

6. 4.
The following table identifies the probability that a computer network will be inoperative for the indicated number of periods per week during the initial installation phase for the network:

Number of Inoperative Periods per Week for a New Computer Network

Number of periods (X)	4	5	6	7	8	9
Probability ($P(X)$)	0.01	0.08	0.29	0.42	0.14	0.06

Calculate

1. the expected number of times per week that the network is inoperative
2. the variance
3. the standard deviation

for this variable.

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