Лабораторна робота 4 Варіант 8

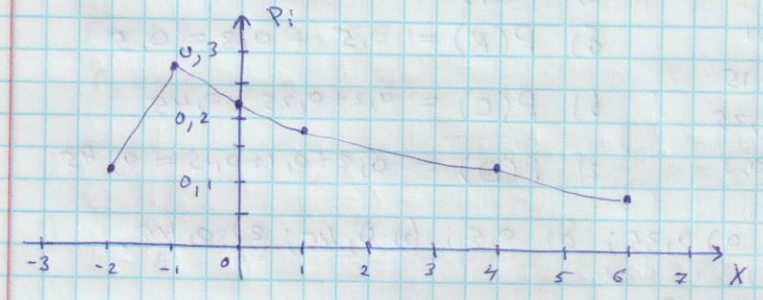
Завдання 1.

X	-2	-1	0	1	4	6
P_i	0,12	0,28	0,22	0,18	0,12	0,08

$$M(x) = \sum_{i=1}^{6} x_i p_i = 0,62$$

$$D(x) = M(x^2) - M^2(x) = \sum_{i=1}^{6} x_i^2 p_i - M^2(x) = 5,3556$$

$$\sigma(x) = \sqrt{D(x)} = 2,31422$$



Завдання 2. $(p = 0,3,\ n = 5)$

X	0	1	2	3	4	5
P_i	0,16807	0,36015	0,3087	0,1323	0,02835	0,00243

$$M(x) = pn = 1,5$$

$$D(x) = pqn = 1,05$$

$$\sigma(x) = \sqrt{pqn} = 1,22474$$

Завдання 3.

$p = 0{,}8$, $n = 4$

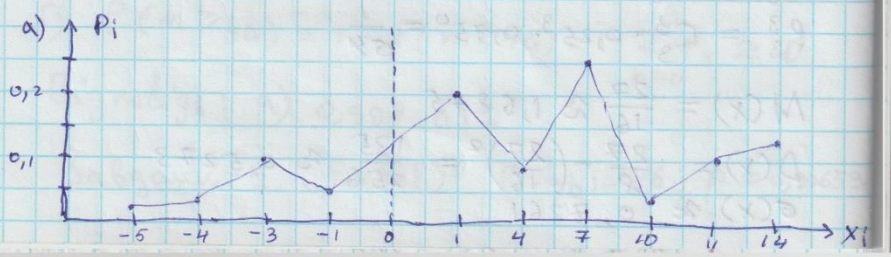
x	0	1	2	3	4
p_i	0,0016	0,0256	0,1536	0,4096	0,4096

$$P_4^0 = C_4^0\, 0{,}8^0 0{,}2^4 = 0{,}0016$$
$$P_4^1 = C_4^1\, 0{,}8^1 0{,}2^3 = 0{,}0256$$
$$P_4^2 = C_4^2\, 0{,}8^2 0{,}2^2 = 0{,}1536$$
$$P_4^3 = C_4^3\, 0{,}8^3 0{,}2^1 = 0{,}4096$$
$$P_4^4 = C_4^4\, 0{,}8^4 0{,}2^0 = 0{,}4096$$

Завдання 4.

x_i	-5	-4	-3	-1	1	4	7	10	11	14	Σ
p_i	0,02	0,03	0,1	0,05	0,2	0,04	a	0,03	0,1	0,13	1

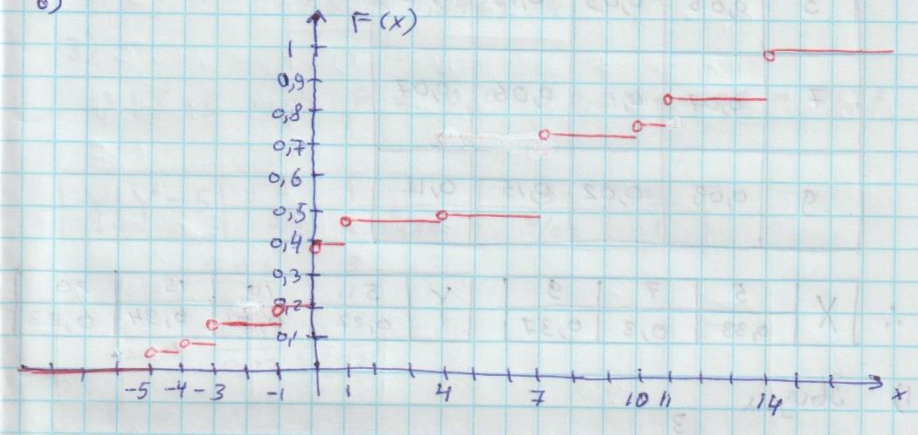
$$\because \sum_i p_i = 1 \quad \therefore \quad 1 - \sum_{i \neq 7}^{10} p_i = a \Rightarrow a = 0{,}3 = p_7$$



б)

$$F(x) = \begin{cases} 0, & x \le -5 \\ 0{,}02, & -5 < x \le -4 \\ 0{,}5, & -4 < x \le -3 \\ 0{,}15, & -3 < x \le -1 \\ 0{,}2, & -1 < x \le 1 \\ 0{,}4, & 1 < x \le 4 \\ 0{,}44, & 4 < x \le 7 \\ 0{,}74, & 7 < x \le 10 \\ 0{,}77, & 10 < x \le 11 \\ 0{,}87, & 11 < x \le 14 \\ 1, & x > 14 \end{cases}$$

в)



г) $M_0 = 7 \quad (p_7 = 0{,}3)$

д) $M_e = X \Leftrightarrow F(X) = 0{,}5 \quad \therefore x = 10$

е) $M(x) = \sum_{i=1}^{10} x_i p_i = 5{,}11$

ж) $D(x) = M(X^2) - M^2(x) = 58{,}05 - 5{,}11^2 = 31{,}9379$

жс) $\sigma(x) = \sqrt{D(x)} = \sqrt{31{,}9379} \approx 5{,}65$

з) $A_S = \frac{M_3}{\sigma^3} = \frac{1}{\sigma^3}(\nu_3 - 3\nu_1\nu_2 + 2\nu_1^2)$

$\nu_k = M(x^k)$

$\therefore A_S = -0{,}0262$

и) $E_S = \frac{M_4}{\sigma_4} - 3 = \frac{1}{\sigma_4}(\nu_4 - 4\nu_1\nu_3 + 6\nu_1^2\nu_2 - 3\nu_1^4) - 3$

$\therefore E_S = -1{,}1077$