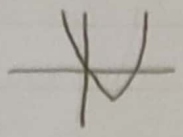
Subject: تکالیف کلاس - حضوری

Date: No:

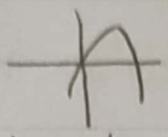
آمار و احتمال

۱۸۱۷۵

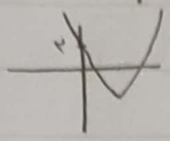
۱) الف) $a>0$ $x_s \left| \frac{-b}{2a} = \frac{1}{2} \right.$ $y_s \left| \Delta_c = -\frac{1}{4} \right.$



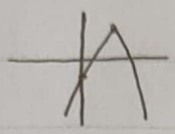
ب) $a<0$ $x_s \left| \frac{-b}{2a} = +2 \right.$ $y_s \left| \Delta_c = 4 \right.$



۲) الف) $a>0$ $x_s \left| \frac{-b}{2a} = \frac{9}{4} \right.$ $y_s \left| \Delta_c = -\frac{29}{8} \right.$



ب) $a<0$ $x_s \left| \frac{-b}{2a} = 2 \right.$ $y_s \left| \Delta_c = 3 \right.$



۳) الف) $\frac{S}{\frac{\sqrt{\Delta}}{|a|}} = \frac{1}{\sqrt{13}} = \frac{\sqrt{13}}{13}$ ب) $S^2 - 2P = 1 + 9 = 10$

ج) $S^3 - 3SP = 1 - 3(1)(-3) = 1 + 9 = 10$ د) $(\alpha-\beta)^3 + 3\alpha\beta(\alpha-\beta) = 13\sqrt{13} - 9\sqrt{13} = 4\sqrt{13}$

۴) $x^2 - ax + a \longrightarrow$ ریشه‌دار $\longrightarrow \Delta < 0 \longrightarrow a^2 - 4a < 0 \longrightarrow a(4-a) < 0$

$a \in (0,4)$ II

$\hookrightarrow x=2 \rightarrow (x-2)^2 = x^2 - 4x + 4 \quad a = 4$ I

$I \cup II = (0,4]$

۵) $ax^2 - ax - b = 0 \longrightarrow S = \frac{a}{a} = 1 \quad P = -\frac{b}{a}$

$4\beta^2 + 20\alpha^2 - 2\alpha\beta = 17 \rightarrow 2\beta^2 + \alpha^2 - \alpha\beta = \frac{17}{20} \rightarrow \beta^2 + \alpha^2 + \beta^2 - \beta = \frac{17}{20}$

$1 + \frac{2b}{a} + \frac{b}{a} = 1 + \frac{3b}{a} = \frac{17}{20} \Rightarrow b = -\frac{a}{20} \rightarrow \beta - \alpha = \frac{\sqrt{\Delta}}{|a|}$

$a^2 - 4ab = a^2 - 4a\left(-\frac{a}{20}\right) = a^2 - \frac{1}{5}a^2 = \frac{4}{5}a^2 \rightarrow \frac{2\frac{a}{\sqrt{5}}}{a} = \frac{2\sqrt{5}}{5}$

۶) $x_s = -\frac{3+1}{2} = -2 \rightarrow \left(-2, -\frac{1}{2}\right)$

$y = ax^2 + bx + c \longrightarrow y = ax^2 + bx + \frac{3}{2}$ $\quad \frac{-b}{2a} = -2 \Rightarrow b = 4a$ $(b=2)$

$y_s = \frac{4ac - b^2}{4a} = -\frac{1}{2} \rightarrow \frac{4 \times a \times \frac{3}{2} - 16a^2}{4a} = \frac{3}{2} - 4a = \frac{1}{2} \rightarrow \frac{3}{2} + \frac{1}{2} = 4a \Rightarrow a = \frac{1}{2}$

$y = \frac{1}{2}x^2 + 2x + \frac{3}{2} \rightarrow 1 \Rightarrow \frac{1}{2} + 2 + \frac{3}{2} = 4 = \beta$

$x^2+4x+a=0 \rightarrow S=-4 \quad P=a>0$

$(\alpha+\beta)^2=\alpha^2+\beta^2+2\alpha\beta \rightarrow ?$

$\Delta=16-4a>0 \rightarrow 16>4a \rightarrow a<4$ ✗

$\frac{-4\pm\sqrt{16-4a}}{2} \rightarrow (-2-\sqrt{4-a})^2 \rightarrow 4+4-a+4\sqrt{4-a} = 18-a+4\sqrt{4-a}$

$18-a+4\sqrt{4-a}+72-4a=85+12\sqrt{2} \Rightarrow a=1$

(۲) (۸)

$36x^2-(m+14)x+1=0 \quad \left(\frac{1}{\sqrt{\alpha}}+\frac{1}{\sqrt{\beta}}\right)^2=25 \quad S=\frac{m+14}{36} \quad P=\frac{1}{36}$

(۵) (۱۵)

$\frac{1}{\alpha}+\frac{1}{\beta}+2\sqrt{\frac{1}{\alpha\beta}} \rightarrow \frac{\beta+\alpha}{\alpha\beta}+2\sqrt{\frac{1}{\alpha\beta}} = \frac{\frac{m+14}{36}}{\frac{1}{36}}+2\sqrt{36}$

$m+14+12=25 \Rightarrow m=-1 \quad P=\frac{+2}{-1}=-2$

(۲) (۹)

$S=4 \quad P=\frac{-a}{3} \quad 3\alpha^2-12\alpha=a \Rightarrow \alpha^2-4\alpha=\frac{a}{3}$

$\alpha^2+\beta^2=S^2-2P=16+\frac{2}{3}a \quad \alpha^2+\beta^2+\alpha^2-4\alpha=7$

$16+\frac{2}{3}a+\frac{a}{3} \Rightarrow 16+a=7 \Rightarrow a=-9$

$3x^2-12x+9=0 \rightarrow (x-1)(x-3)=0$ (1, 3)

$\frac{-9}{3}=-3$