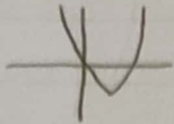
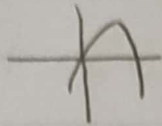
Subject: آمادگی ۱۴۰۲ - ...   آیسا علیاری

Date: No:

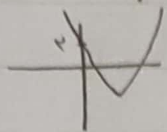
① الف) ۳ ← ۳ $a>0$ $x_s = \frac{-b}{2a} = \frac{1}{3}$, $y_s = $ ج ق $= -\frac{1}{3}$



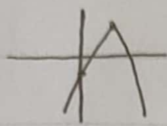
ب) ۲ ← ۲ $a<0$ $x_s = \frac{-b}{2a} = +2$, $y_s = $ ج ق $= 4$



② الف) $a>0$ $x_s = \frac{-b}{2a} = \frac{5}{4}$, $y_s = $ ج ق $= -\frac{49}{8}$
↓ ۱ و ۲ و ۴



ب) $a<0$ $x_s = \frac{-b}{2a} = 2$, $y_s = $ ج ق $= 3$
↓ ۱ و ۳ و ۴



③ الف) $\frac{S}{\frac{\sqrt{\Delta}}{|a|}} = \frac{1}{\sqrt{13}} = \boxed{\frac{\sqrt{13}}{13}}$ ب) $S^2 - 2P = 1 + 6 = \boxed{7}$

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

④ $x^2 - ax + a$ ← ریشه ندارد ← $\Delta < 0 \to a^2 - 4a < 0 \to a(4-a) < 0$ ج ← $\boxed{a \in (0, 4)}$

⑦ $ax^2 - ax - b = 0 \to S = \frac{a}{a} = 1$ $P = -\frac{b}{a}$

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

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

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

⑧ $x_s = -\frac{5+1}{2} = -2 \to \left(-2, -\frac{1}{2}\right)$

$y = ax^2 + bx + c \to y = ax^2 + bx + \frac{3}{2}$ $\frac{-b}{2a} = -2 \Rightarrow b = 4a$ $\boxed{b=2}$

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

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

dotnote

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

$(\alpha+\beta)^2=\alpha^2+\beta^2+2\alpha\beta \rightarrow ?$ (۹)

$\Delta=16-4a>0 \rightarrow 16>4a \rightarrow a<9+$

$\frac{-4\pm\sqrt{16-4a}}{2} \rightarrow (-2-\sqrt{9-a})^2 \rightarrow 9+9-a+4\sqrt{9-a}=18-a+4\sqrt{9-a}$

$18-a+4\sqrt{9-a}+72-4a=80+12\sqrt{2} \Rightarrow \boxed{a=1}$

$16x^2-(m+14)x+1=0 \quad \left(\frac{1}{\sqrt{\alpha}}+\frac{1}{\sqrt{\beta}}\right)^2=2\sqrt{3} \quad S=\frac{m+14}{16}$ (۱۰)

$P=\frac{1}{16}$

$\frac{1}{\alpha}+\frac{1}{\beta}+2\sqrt{\frac{1}{\alpha\beta}} \rightarrow \frac{\beta+\alpha}{\alpha\beta}+2\sqrt{\frac{1}{\alpha\beta}}=\frac{\frac{m+14}{16}}{\frac{1}{16}}+2\sqrt{16}$

$m+14+12=2\sqrt{3} \Rightarrow \boxed{m=-1} \quad P=\frac{+2}{-1}=\boxed{-2}$

$S=4 \quad P=\frac{-a}{3} \quad 3\alpha^2-12\alpha=a \Rightarrow \alpha^2-4\alpha=\frac{a}{3}$ (۹)

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

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

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

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