Subject: Date: مدرسی کاظمی

۱-

$-\frac{b}{2a}=2 \rightarrow 4a=-b \qquad 4(a-1)=-1 \rightarrow 4a-4=-1$

$4a=3$

$a=\frac{3}{4}$

$(\frac{3}{4}-1)x^2+x+3=y$

$-\frac{1}{4}x^2+x+3=y \rightarrow -\frac{1}{4}x^2+x+3=0$

$-x^2+4x+12=0$

$x^2-4x-12=0$

$(x-6)(x+2)=0$

$6 \qquad -2$

۲-

$f(x)=mx^2-5x+m$

$x_1 \quad x_2$

$- \quad + \quad -$

$\begin{cases} \Delta>0 \\ m<0 \end{cases}$

$\Delta>0 \rightarrow 25-4(m)(m)=25-4m^2>0$

$25>4m^2$

$\frac{25}{4}>m^2$

$\frac{5}{2}>m$

$m<\frac{5}{2}$

۳-

$\frac{3+\sqrt{5}}{3}$ و $\frac{3-\sqrt{5}}{3}$ $\qquad x^2-Sx+P$

$S=\frac{3+3}{3}=\frac{6}{3}=2 \qquad x^2-2x+\frac{4}{9}$

$P=\frac{9-5}{9}=\frac{4}{9}$

۴-

$3x^2-8x+m+2=0 \qquad \alpha<\beta \qquad 3\alpha^2+\beta^2=12$

$S=\alpha+\beta=\frac{-b}{a}=\frac{8}{2}=4 \qquad P=\alpha\beta=\frac{c}{a}=\frac{m+2}{2}$

$(\alpha+\beta)^2=\alpha^2+\beta^2+2\alpha\beta \qquad \beta^2=12-3\alpha^2$

$16=\alpha^2+12-3\alpha^2+2(\frac{m+2}{2}) \Rightarrow 16=-2\alpha^2+12+\frac{2m+4}{2}$

$16=-2\alpha^2+12+m+2$

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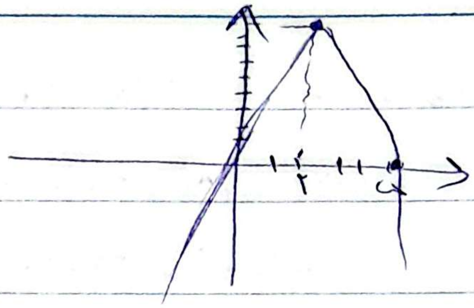
$S(2,9)$ $\Big|^{0}_{5}$



$-\frac{b}{2a} = 2$

$-b = 4a$

$\frac{-\Delta}{4a} = 9$ $4ac - b^2 = 36a$

$20a - 16a^2 = 36a \Rightarrow -16a^2 = 16a \Rightarrow -a = 1$

$f(x) = -x^2 + 4x + 5$ $a = -1, b = 4$

$x = 5, -1$ $\Big|^{-1}_{5}$

۶ -

$ax^2 - 7x + 9\beta = 0$ $\beta > 0$, $\alpha < 0$ $\frac{1}{\alpha} + \frac{1}{\beta} = \frac{S}{P}$

$S = \frac{7}{\alpha}$ $P = \frac{\beta}{\alpha}$ $\frac{\frac{7}{\alpha}}{\frac{\beta}{\alpha}} = \frac{7}{\beta} = \frac{21}{2}$

$\alpha^3 - 7\alpha - \frac{18}{\alpha} = 0 \Rightarrow \alpha^4 - 7\alpha^2 - 18 = 0 \rightarrow t^2 - 7t - 18 = 0$

$(t-9)(t+2)$

$a = 3$ ✓ ← 9 ; -2 ✗

-3 ✗

$-1 + \sqrt{20} - 1 - \sqrt{20} = -2$ ✓ جواب

$x^2 + mx - 2m = 0$ $\alpha^2 - m\beta = 8$

$\alpha^2 + m\alpha - 2m = 0$ $m = 2 \rightarrow x^2 + 2x - 4 = 0$

$\alpha^2 = -m\alpha + 2m$ $\frac{-2 \pm \sqrt{20}}{2} = -1 \pm \sqrt{20}$

$-m\alpha + 2m - m\beta = 8$ $m = -4 \rightarrow x^2 - 4x + 8 = 0$

$\Delta < 0 \rightarrow$ ✗

$-m(\alpha + \beta) + 2m = 8$

$-m(-m) + 2m = 8 \rightarrow m^2 + 2m = 8$

$m^2 + 2m - 8 = 0 \rightarrow (m+4)(m-2)$

منفی ۵ ← ✗ (-4) ← (2)

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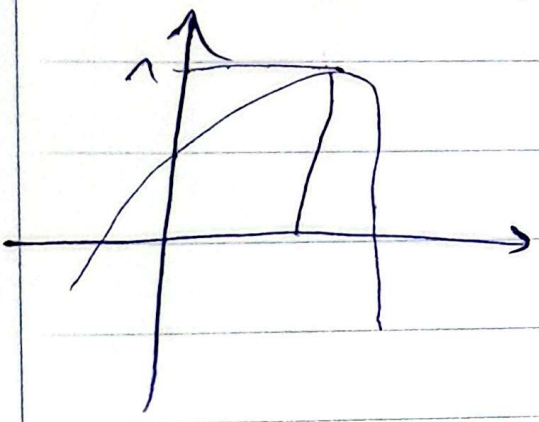
۱- $f(x) = mx^2 + 4x + \frac{m}{4} + 7$



$\frac{-\Delta}{4a} = 8$ $\quad 4ac - b^2 = 32a$

$2m^2 - 4m - 16 = 0$

$m^2 - 2m - 8 = 0 \rightarrow (m-4)(m+2)$

$a < 0 \rightarrow$ منفی m

$f(x) = -2x^2 + 4x + 6 \rightarrow x = 2 = 1$

$x = -1$

۹- $\frac{1}{\alpha} + \frac{1}{\beta} = \frac{5}{12}$ $\quad S > 0$ $\quad \frac{c}{-8} = -\frac{1}{2}$

$12 > -8$

$\frac{4ac - b^2}{4a} = 6 \rightarrow 4ac - b^2 = 24a \quad -4b - b^2 = 6b = 1$

$2b = b^2$

$\frac{-b}{2a} = 2 \Rightarrow -b = 4a$ $\quad f(x) = -\frac{1}{4}x^2 + 2x + 2$ $\quad b = 2$

$a = -\frac{1}{2}$

$c = 2$

۱۰- $x^2 - (4a+4)x + (3a^2 + 6a + 3) = 0$

$4 - 8a - 8 + 4a^2 + 6a + 3 = 0$

$4a^2 - 2a - 1 = 0 \swarrow \quad \searrow a = 1 \rightarrow x^2 - 8x + 12 = 0$

$(x-2)(x-6) = 0$

$a = -\frac{1}{2} \Rightarrow x^2 - \frac{8}{4}x + \frac{6}{12} = 0$

$(x - \frac{2}{3})(x-2)$

$\frac{2}{3}$ $\quad 2$