

4) $y = ax^2 + bx + c$ (P31) $\in \mathbb{R}^2$ ازس (مضروب) و (مضروب) و (مضروب) و (مضروب)

$y = a(x+1)^2 + 9$ $\rightarrow 1 = a(1)^2 + 9 \rightarrow 1 - 9 = -8 = -8a \rightarrow a = 1$

$y = ax^2 + 2ax + a + 9$ $\rightarrow y = x^2 - 2x + 10$

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(۷) $px^2 + mx + m + 9 = 0$

$\Delta > 0 \rightarrow m^2 - 4(p(m+9)) > 0 \rightarrow m^2 - 4pm - 36p > 0$

$(m-12)(m+3) > 0$

$S = \frac{-b}{a} > 0 \rightarrow \frac{-m}{p} > 0 \rightarrow m < 0$

$\frac{m+9}{p} > 0 \rightarrow m > -9$

$\Rightarrow -9 < m < -12 \rightarrow m \in (-12, -9)$

(۸) $px^2 + (r-1)x + r - m$ $(r-1)^2 - 4p(r-m) > 0$

$\Delta m^2 + 4m - 4r > 0$

$\Delta m^2 + 4m - 4r > 0 \rightarrow m < -1 \rightarrow r - 1 - 4r < 0$

$\frac{1-rm}{p} < \frac{r}{r-m} \rightarrow r - m - \Delta m + 4m^2 > 0$

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

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

$(m-2)(m+2) = 0 \rightarrow m \in \{2, -2\}$

$m = -1$ جواب

(۹) $x_1 = x_2 = r$

$x_1^2 - x_2^2 - r = 0$

$S = \frac{-b}{a} = 1$

$P = \frac{c}{a} = -r$

$y = x^2 - Sx + P$

$y = x^2 - \frac{21}{r}x - \frac{r}{r} \Rightarrow y = rx^2 - 21x - r$

$\alpha_1^2 + \frac{1}{\alpha_2} = \alpha_2^2 + \frac{1}{\alpha_1}$

$S = \alpha_1^2 + \alpha_2^2 + \frac{1}{\alpha_1} + \frac{1}{\alpha_2} \rightarrow S^2 - 4ps + \frac{4}{p}$

$1 + 4 + \frac{1}{r} = \frac{16r - 4}{r} = \frac{12r}{r}$

$P = (\alpha_1 \alpha_2)^2 + \alpha_1^2 + \alpha_2^2 + \frac{1}{\alpha_1 \alpha_2} =$

$P^2 + S^2 - 4p + \frac{1}{p} = -4r + 1 + 1 - \frac{1}{r} = \frac{-4r}{r}$

(۱۰) $(\sqrt{x} + \frac{1}{\sqrt{x}} + 1)(\sqrt{x} - 1) = r\sqrt{x}$

$(\sqrt{x} - 1)(\sqrt{x} + 1) \rightarrow (x-1) = r\sqrt{x}$

$x^2 - 1 - rx = 0$

$\Delta = r^2 + 4 > 0$

$S = \frac{-b}{a} = \frac{-r}{1} = -r$

(4) $px^2 - ax + f = 0$

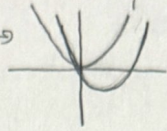
$\alpha = \frac{p}{q}$
 $B = \alpha$
 $px^2 = \frac{f}{p} \rightarrow ax = \frac{f}{q} \rightarrow x = \frac{f}{pq}$
 $px^2 - ax + \frac{f}{p} = 0$
 $S = -\frac{b}{a} \rightarrow \frac{a}{p} = f \rightarrow \frac{a}{p} = \frac{f}{p} \Rightarrow a = f$
 $px^2 - ax = -\frac{f}{p}$
 $\alpha = -\frac{f}{p}$
 $\frac{a}{p} = f \rightarrow \frac{a}{p} = -\frac{f}{p} \rightarrow a = -f$

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(v) $y = ax^2 + (p+q)x$

$C = 0$



$\Delta \geq 0$
 $a > 0$

$(p+q)x^2 - fx \geq 0 \rightarrow 9 + 8ax^2 + 11x - fa \geq 0$

$fa^2 + 11a + 9 \geq 0$

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$a > 0$

$S > 0 \rightarrow \frac{-p-12}{a} \geq 0$

(vi) $y = x^2 + ax - p \rightarrow \frac{-a}{1} = -1 \rightarrow a = p$

$y = -x^2 - px + b \rightarrow a = -1 \rightarrow \frac{-b}{-1} = -1 \rightarrow b = -1$

$y = x^2 + px - r \rightarrow x^2 + px - r = 1 \rightarrow x^2 + px - r - 1 = 0 \rightarrow (x+1)(x-1) = 0 \rightarrow x = 1, x = -1$

$y = -x^2 - px + b \rightarrow -x^2 - px + b = 1 \rightarrow -x^2 - px + b - 1 = 0 \rightarrow -1 - r + b - 1 = 0 \rightarrow b = 2 + r$

$ab = pxr = 1$

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(vii) $px^2 - ax + b = 0 \rightarrow S = \frac{a}{p}$

$px^2 + ax - 4 = 0 \rightarrow S = \frac{-a}{p} = -\frac{1}{p} \rightarrow \frac{1}{p} + 1 = \frac{1}{p} \rightarrow a = 1$

$px^2 + x - 4 = 0 \rightarrow (AC) \rightarrow x^2 + x - 12 = 0 \rightarrow (x-3)(x+4) = 0 \rightarrow \begin{cases} x = 3 \\ x = -4 \end{cases}$

$P = \frac{c}{a} = \frac{b}{p} = -\frac{4}{p} \rightarrow b = -\frac{4}{p}$

$\left[\frac{ab}{2}\right] = \left[-\frac{4}{2}\right] = [-2] = -1$

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(viii) $x^2 + 4x + m = 0$

$\epsilon = -\epsilon m \rightarrow x = -m$

$x^2 + 4x + m = 0$

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

$m^2 = 3m \rightarrow m = 0 \vee m = 3$

$x^2 + 4x + 3 = (x+1)(x+3) = 0 \rightarrow x = -1, x = -3$

$x^2 + 4x - 12 = (x+6)(x-2) = 0 \rightarrow x = -6, x = 2$

النتيجة = $3 - (-1) = 4$

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