کیمیا رحیمی — شماره پاسخنامه تکلیف ۱۳ — گروه یازدهم دختر A

1

$y = x^2 - 4x + 7$

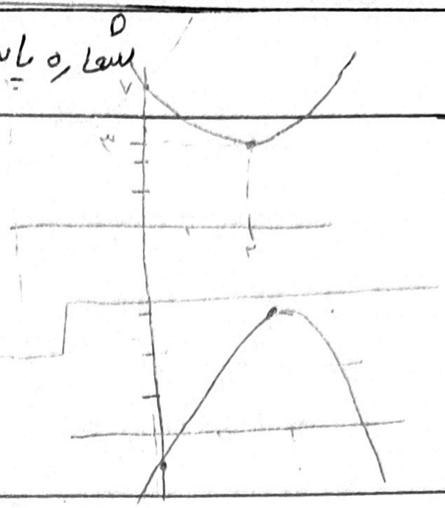
$\frac{-b}{2a} \longrightarrow \frac{4}{2} = 2$

$\frac{-\Delta}{4a} \longrightarrow \frac{-(16 - 4(1)(7))}{4} = \frac{12}{4} = 3$

$y = -x^2 + 4x - 1$

$\frac{-b}{2a} \longrightarrow \frac{-4}{-2} = 2$

$\frac{-\Delta}{4a} \longrightarrow \frac{-(16 - 4(-1)(-1))}{-4} = \frac{-12}{-4} = 3$



2

$2x^2 + (m+1)x + \frac{1}{2}m + 2 = 0$

الف) $\Delta > 0 \Leftarrow (m+1)^2 - 4(2)(\frac{1}{2}m+2) > 0$

$m^2 + 2m + 1 - 4m - 16 > 0 \Rightarrow m^2 - 2m - 15 > 0 \Rightarrow (m-5)(m+3) > 0 \longrightarrow (-\infty, -3) \cup (5, +\infty)$

ب) $\Delta = 0$ $(m+1)^2 - 4(2)(\frac{1}{2}m+2) = 0 \longrightarrow m = -3, \; m = 5$

ج) $\Delta < 0 \longrightarrow (-3, 5)$

د) $\Delta \geq 0 \longrightarrow (-\infty, -3] \cup [5, +\infty)$

3

$y = (m-2)x^2 - 2(m+1)x + 10$

الف) $S < 0 \quad P > 0 \Leftarrow$

$S \Rightarrow \frac{2(m+1)}{m-2} < 0$ $\quad \frac{-1 \quad 2}{+ \,|\, - \,|\, +} \longrightarrow (-\infty, -1) \cup (2, +\infty)$ I $\quad \xrightarrow{I \cap II} (2, +\infty)$

$P > 0 \longrightarrow \frac{c}{a} \Rightarrow \frac{10}{m-2} > 0$ $\quad \frac{2}{- \,|\, +}$ $\quad (2, +\infty)$ II

ب)

$\beta < 0 \quad \alpha > 0 \longrightarrow |\beta| > |\alpha| \Rightarrow S < 0 \longrightarrow \frac{2(m+1)}{m-2} < 0$ $\quad \frac{-1 \quad 2}{+ \,|\, - \,|\, +} \rightarrow (-1, 2)$ I

$P < 0 \Rightarrow \frac{10}{m-2} < 0$ $\quad \frac{2}{- \,|\, +} \rightarrow (-\infty, 2)$ II $\xrightarrow{I \cap II} (-1, 2)$

4

$y = (m-2)x^2 - 2(m+1) + 10$ $\longrightarrow$ همواره دو ریشه مختلف العلامه دارد.

الف)

$\Rightarrow \Delta > 0, \; P < 0 \longrightarrow (-2m-2)^2 - 4(m-2)(10) = -4m^2 + 8m + 4 - 40m + 80 = -4m^2 - 48m + 84 >$

$m^2 + 12m - 21 >$

$P < 0 \longrightarrow \frac{10}{m-2} < 0$ $\quad \frac{2}{- \,|\, +}$ $\quad (-\infty, 2)$

ب)

محور تقارن $= \frac{-b}{2a} = -2 \Rightarrow \frac{2m+2}{2m-4} = -2 \rightarrow 2m+2 = -4m+8$

$6m = 6 \rightarrow m = 1$

5

$\frac{2x^2}{3} - (2\sin a)x + \frac{3}{2} = 0 \xrightarrow{\times 6} 4x^2 - (12\sin a)x + 9 = 0$

$\frac{c}{a} = \frac{9}{4} \xrightarrow{\text{ریشه اصلی}} \pm \frac{3}{2}$ $\xrightarrow[\text{مورد قبول است.}]{\text{چون تکراری است}}$ $\boxed{\frac{3}{2}}$ ریشه

د) ریشه مضاعف دارد در نتیجه ضرب ریشه مجذور ضرب ریشه هاست.

$$y = \frac{(3x^2 - 2x - 1)(2x^2 - 3x - 5)}{1 - x^2} = \frac{\cancel{(x-1)}(3x+1)\cancel{(x+1)}(2x-5)}{-\cancel{(x-1)}\cancel{(x+1)}}$$

$$= -(3x+1)(2x-5) = -(6x^2 - 13x - 5) = -6x^2 + 13x + 5 = 0 \rightarrow \frac{-\Delta}{4a} = \frac{+289}{-24}$$

$$\Delta = 169 - 4(-6)(5) = 289$$

6

$\xrightarrow{\text{روش ضرب}} 3x^2 - 2x - 1 \rightarrow x^2 - 2x - 3 = (x-3)(x+1) \rightarrow (x-1)(3x+1)$

$\searrow 2x^2 - 3x - 5 \rightarrow x^2 - 3x - 10 = (x-5)(x+2) \rightarrow (x+1)(2x-5)$

$3(\alpha+\beta) = 5\alpha\beta + 7 \qquad mx^2 - (m+2)x - 2 = 0$

$\alpha\beta = \frac{-2}{m}$, $\alpha+\beta = \frac{m+2}{m}$ $\rightarrow 3\left(\frac{m+2}{m}\right) = 5\left(\frac{-2}{m}\right) + 7 \rightarrow \left(\frac{3m+6}{m} = \frac{-10}{m} + 7\right) \times m$

7

$3m + 6 = -10 + 7m \Rightarrow 16 = 4m \rightarrow \boxed{m = 4}$

$\xrightarrow{m=4} 4x^2 - (6)x - 2 = 0 \longrightarrow \alpha^2 + \beta^2 = S^2 - 2P = \frac{9}{4} - 2\left(-\frac{1}{2}\right) = \frac{9}{4} + \frac{4}{4} = \frac{13}{4}$

$x^2 - 5x + 2 = 0 \qquad \alpha + \beta = 5 \qquad \alpha\beta = 2 \rightarrow \beta = \frac{2}{\alpha}$

$$\frac{4a + \beta^5}{5\beta^2} \longrightarrow \frac{4a}{5\beta^2} + \frac{\beta^3}{5} \rightarrow \frac{4}{5}\left(\frac{a}{\frac{4}{a^2}}\right) + \frac{\beta^3}{5} = \frac{a^3}{5} + \frac{\beta^3}{5}$$

8

$$\Rightarrow \frac{a^3 + \beta^3}{5} = \frac{S^3 - 3PS}{5} = \frac{125 - 3(2)(5)}{5} = \frac{125 - 30}{5} = \boxed{19}$$

$y_1 = ax^2 + bx + c \quad \xRightarrow{x=2} 4a + b + c = 14$

$y_2 = 2x + 10 \quad \xRightarrow{x=-3} 9a - 3b + c = 4$

$\xrightarrow{c=4} \begin{cases} 4a + b = 10 \\ 9a - 3b = 0 \end{cases}$

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$\begin{cases} 12a + \cancel{3b} = 30 \\ 9a - \cancel{3b} = 0 \end{cases}$

$21a = 30 \Rightarrow a = \frac{10}{7}$, $b = \frac{30}{7}$

محور تقارن $= -\frac{b}{2a} = \frac{-\frac{30}{7}}{\frac{20}{7}} = \boxed{-\frac{3}{2}}$

$y = 2x^2 + (m+1)x + m + 6 \Rightarrow x = 2x^2 + (m+1)x + m + 6$

$\Rightarrow 2x^2 + mx + m + 6 = 0$

10

$x = y$

$\Delta = 0 \rightarrow m^2 - 4(2)(m+6) = 0$

$m^2 - 8m - 48 = 0$

$(m - 12)(m + 4) = 0 \rightarrow \boxed{m = -4}$, $m = 12$

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

$x = 1$, $y = 1$ در ناحیه اول است

if $x = 12 \longrightarrow 2x^2 + 12x + 18 = 2(x+3)^2 \quad (-3, -3)$ در ناحیه اول نیست