page: ( )

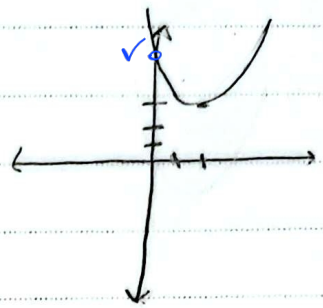
Subject:
Year: Month: Day:

۱۹

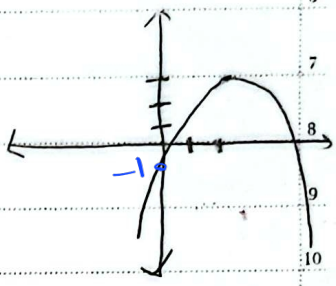
دبیرستان صادق زاده - یازدهم رشته ...

سوال ۱)

الف) $y = x^2 - 4x + 7$ $\quad \min \left| \begin{matrix} -\frac{b}{2a} = 2 \\ 3 \end{matrix} \right.$



ب) $y = -x^2 + 4x - 1$ $\quad \max \left| \begin{matrix} -\frac{b}{2a} = 2 \\ 3 \end{matrix} \right.$



۱,۵

سوال ۲)

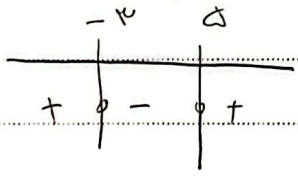
$y = 2x^2 + (m+1)x + \frac{1}{2}m + 2$

۵

الف) $\Delta > 0 \quad (m+1)^2 - 4(2)\left(\frac{1}{2}m + 2\right) = m^2 + 2m + 1 - 4m - 16$

$= m^2 - 2m - 15 > 0$

$(m-5)(m+3) > 0$



$\rightarrow m \in (-\infty, -3) \cup (5, +\infty)$

ب) $\Delta = 0$ ← تعداد ریشه‌ها

$\rightarrow m = -3$

$\rightarrow m = 5$

ج) $\Delta < 0 \rightarrow m \in (-3, 5)$ ← تعداد ریشه‌ها

د) $\Delta \geq 0 \rightarrow m \in (-\infty, -3] \cup [5, +\infty)$ ← تعداد ریشه‌ها

سوال ۳)

$y = (m-2)x^2 - 2(m+1)x + 10 \quad S < 0 \quad P > 0 \quad \Delta > 0$

$\Delta > 0 \rightarrow (2m-2)^2 - 4(m-2)(10) = 4m^2 + 4 - 8m - 40m + 80 =$

$4m^2 - 32m + 84 > 0 \xrightarrow{\div 4} m^2 - 8m + 21 > 0 \rightarrow$ همواره برقرار

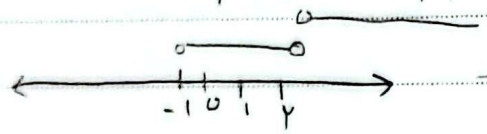
$\hookrightarrow \Delta < 0$

Arman

Subject:
Year Month Day page: ( )

$S<0 \rightarrow \frac{2m+2}{m-2}<0$; sign chart: -1 (+), 2 (−), (+) $\Rightarrow m \in (-1, 2)$

$P>0$; $\frac{10}{m-2}$; sign chart: 2 (−), (+) $\Rightarrow m \in (2, +\infty)$ (ج)

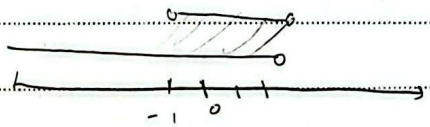


$\Rightarrow (1) \cap (2) = \emptyset$

ب) $|-\alpha| > |\beta|$ $\Delta > 0$ $P < 0$ $S < 0$

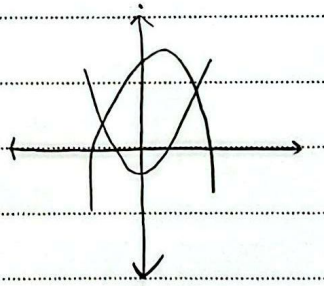
$\Delta > 0$ ط.ف ← همواره برقرار ; $P<0 \rightarrow \frac{10}{m-2} \rightarrow m < 2$ (1)

$S<0$ ط.ف ← $m \in (-1, 2)$ (2)



$(1) \cap (2) \rightarrow m \in (-1, 2)$

سوال ۴) الف)



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

$\Delta > 0$ $P < 0$ (ج)

$\Delta = (-2m-2)^2 - 4(m-2)(10) = 4m^2 + 4 + 8m - 40m + 80 = 4m^2 - 32m + 84$

$m^2 - 8m + 21 > 0$ ← همواره برقرار ; $\frac{10}{m-2} < 0$; sign chart: 2 (−), (+) $\Rightarrow m < 2$

ب)

$-\frac{b}{2a} = \frac{2m+2}{2m-4} = \frac{m+1}{m-2} = -2 \Rightarrow -2m+4 = m+1$

$\rightarrow 3m = 3 \Rightarrow m = 1$

Arman

page: ( )

Subject:

Year: Month: Day:

۵) $y = \frac{1}{3}x^2 - (2\sin\alpha)x + \frac{3}{4} = 0$

۵) $\Delta \geq 0 \quad 4\sin^2\alpha - 4\left(\frac{1}{3}\right)\left(\frac{3}{4}\right) \Rightarrow 4\sin^2\alpha - 1 \geq 0$

$4\sin^2\alpha \geq 1$

$\sin^2\alpha \geq \frac{1}{4} \rightarrow \sin^2\alpha \geq \left(\frac{1}{2}\right)^2$

$\rightarrow \sin\alpha \geq \frac{1}{2} \Rightarrow \sin\alpha \geq \pm\frac{1}{2}$

$\sin\alpha \geq \frac{1}{2}$ $\quad \frac{1}{3}x^2 - 2x + \frac{3}{4} = 0 \quad \Delta = 4 - 3 = 1 \rightarrow x = \frac{2+\sqrt{1}}{\frac{2}{3}} = \frac{3}{2}$

$\sin\alpha \leq -\frac{1}{2}$ $\quad \frac{1}{3}x^2 + 2x + \frac{3}{4} = 0 \quad \Delta = 4 - 3 = 1 \rightarrow x = \frac{-2+\sqrt{1}}{\frac{2}{3}} = -\frac{3}{2}$

$\alpha \in [\frac{\pi}{6}, \frac{5\pi}{6}]$

۴) $\frac{(3n^2-2n-1)(2n^2-3n-5)}{1-n^2} = \frac{(-1)(1-n)(3n+1)(2n-5)(n+1)}{(1-n)(n+1)}$

۵)

$3n^2 - 2n - 1 \;\big|\; n-1$

$-3n^2 + 3n \quad\quad 3n+1$

$n - 1$

$-n + 1$

0

$= -(2n-5)(3n+1) = -6n^2 + 13n + 5$

$2n^2 - 3n - 5 \;\big|\; n+1$

$-2n^2 - 2n \quad\quad 2n-5$

$-5n - 5$

$-5n - 5$

0

$\frac{-b^2+4ac}{4a} \quad \frac{-169-120}{-24} = \frac{289}{24}$

۷) $3x^2 - (m+2)x - 2m = 0 \qquad 3(\alpha+\beta) = 2(\alpha\beta) + 7$

۵) $\frac{m+2}{m} \quad\quad \frac{-2}{m}$

$\frac{2m+4}{m} = \frac{-10+7m}{m} \qquad -\frac{10}{m} + 7 = \frac{-10+7m}{m}$

$\Rightarrow 2m + 4 = -10 + 7m \Rightarrow 5m = 14 \Rightarrow m = \frac{14}{5}$

Arman

$\alpha^2 + \beta^2 = S^2 - 2P = \left(\frac{1}{2}\right)^2 - 2\left(-\frac{1}{2}\right) = \frac{1}{4} + 1 = \frac{5}{4}$

Subject:
Year: Month: Day: page: ( )

سوال ۸)

$x^2 - 5x + 24$ $\qquad \frac{4\alpha + \beta^4}{5\beta^2}$

$S = 5 = \alpha + \beta \Rightarrow \alpha = 5 - \beta$

$\beta^2 - 5\beta + 2 = 0 \rightarrow \beta^2 = 5\beta - 2 \xrightarrow{\times 5} 5\beta^2 = 25\beta - 10$

$\beta^4 = (5\beta - 2)^2 \Rightarrow \beta^4 = 25\beta^2 + 4 - 20\beta \Rightarrow 125\beta - 50 + 4 - 20\beta$

$\Rightarrow \beta^4 = 105\beta - 46 \xrightarrow{\times\beta} \beta^5 = 105\beta^2 - 46\beta =$

$= 525\beta - 210 - 46\beta = 479\beta - 210 = \beta^5$

$\frac{4(5-\beta) + 479\beta - 210}{5(5\beta - 2)}$ ، $\frac{20 - 4\beta + 479\beta - 210}{25\beta - 10}$ ، $\frac{475\beta - 190}{25\beta - 10}$

$\frac{19(25\beta - 10)}{25\beta - 10} = 19$

سوال ۹)

$\begin{cases} 4a + 2b + 4 = 14 \\ 9a - 3b + 4 = 4 \end{cases}$

$y_1 = ax^2 + bx + 4$

$y_2 = 2x + 10 \xrightarrow{x=2} y = 14$ $\qquad \begin{cases} 2a + b = 5 \\ 3a - b = 0 \end{cases}$

$\xrightarrow{x=-4} y = 4$

$5a = 5 \rightarrow a = 1$

$b = 3$

$x_s = -\frac{b}{2a} = \frac{-3}{2}$

Arman

سوال ۱۰) $y = 2x^2 + (m+1)x + m + 4$

۱,۵

$y = x \rightarrow x = 2x^2 + (m+1)x + m + 4$

$\rightarrow 2x^2 + mx + m + 4 = 0$

$\Delta = 0$

$m^2 - 4(2)(m+4) = m^2 - 8m - 48 = 0$

$(m-12)(m+4) = 0$

$\rightarrow m = 12 \,,\; m = -4$ ✗ ✓

Year: Month: Day: