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نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ..... کلاس ..... (جمعه ۱۵)

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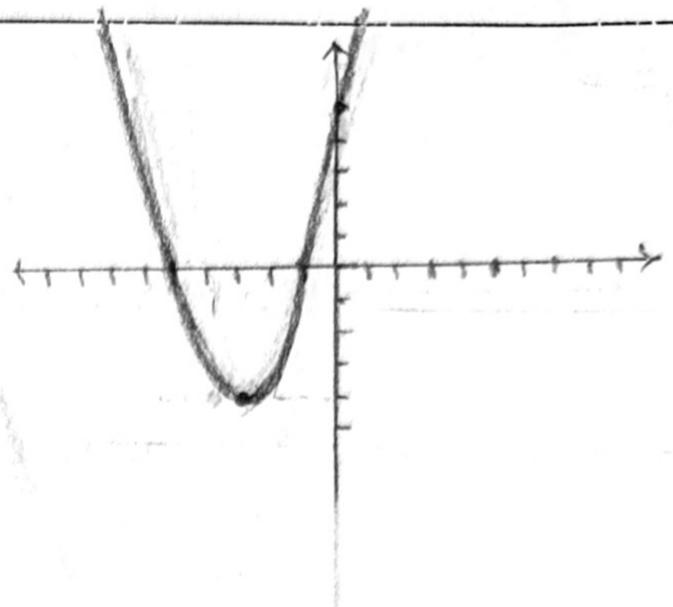
$y = x^2 + 4x + 5$

$a > 0 \longrightarrow \cup \longrightarrow \min$

$\min \begin{cases} \frac{-b}{2a} = \frac{-4}{2} = -2 \\ \frac{-\Delta}{4a} = \frac{-(b^2-4ac)}{4} = \frac{-(16-20)}{4} = \frac{-16}{4} = -4 \end{cases}$

عرض رأس $= \begin{vmatrix} -2 \\ -4 \end{vmatrix}$



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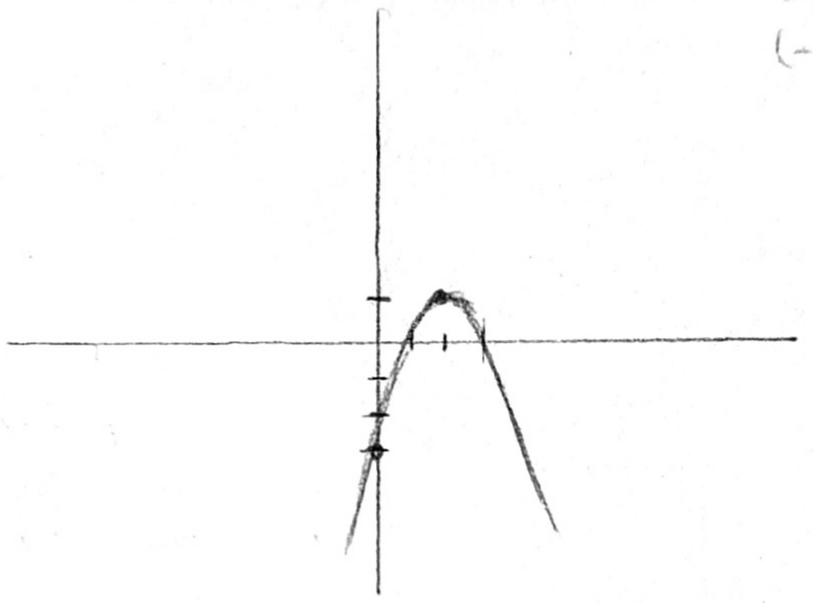
$y = -x^2 + 4x - 3$

$a < 0 \longrightarrow \cap \longrightarrow \max$

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

$y = (-1)\times 4 + 8 - 3 = 1$

عرض رأس $= \begin{vmatrix} 2 \\ 1 \end{vmatrix}$



$(-1)(3) = -x^2 + 4x - 3) \times (-1)$

$x^2 - 4x + 3 = 0$

$(x-1)(x-3) = 0$

$x = 1 \quad x = 3$

$(1,0) \quad , \quad (3,0)$

در این نقاط که xها را قطع می‌کند

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$2x^2 - 3x + a = 0$

۱) $\Delta = b^2 - 4ac = (-3)^2 - 4(2)(a) = 9 - 8a \longrightarrow \Delta > 0 \Rightarrow 9 - 8a > 0 \Rightarrow a < \frac{9}{8}$

۲) $\Delta = 0 \longrightarrow 9 - 8a = 0 \longrightarrow 9 = 8a \longrightarrow a = \frac{9}{8}$

۳) $\Delta < 0 \longrightarrow 9 - 8a < 0 \longrightarrow -8a < -9 \longrightarrow a > \frac{9}{8}$

۴) $\Delta \geq 0 \longrightarrow 9 - 8a \geq 0 \longrightarrow -8a \geq -9 \longrightarrow a \leq \frac{9}{8}$

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الف) $x^2 - 4x - 1 = 0 \longrightarrow \left(\frac{-4}{2}\right)^2 = 4$

$1 + x^2 - 4x = 1 + 4 \longrightarrow x^2 - 4x + 4 = 5$

$(x-2)^2 = 5 \longrightarrow x - 2 = \pm\sqrt{5} \quad x = 2 \pm \sqrt{5} \quad x_1 = 2 + \sqrt{5} \quad x_2 = 2 - \sqrt{5}$

ب) $x^2 - x - 1 = 0 \longrightarrow \left(\frac{-1}{2}\right)^2 = \frac{1}{4}$

$\frac{1}{4} + x^2 - x = 1 + \frac{1}{4}$

$(x - \frac{1}{2})^2 = \frac{5}{4}$

$x - \frac{1}{2} = \pm\sqrt{\frac{5}{4}} \longrightarrow x = \frac{1}{2} \pm \sqrt{\frac{5}{4}} \quad x_1 = \frac{1}{2} + \sqrt{\frac{5}{4}} \quad x_2 = \frac{1}{2} - \sqrt{\frac{5}{4}}$

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الف) $x^2 - 2x - 1 = 0 \quad x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{-(-2) \pm \sqrt{8}}{2} = \frac{2 \pm 2\sqrt{2}}{2} = 1 \pm \sqrt{2} \longrightarrow x_1 = 1 + \sqrt{2} \quad x_2 = 1 - \sqrt{2}$

$\Delta = b^2 - 4ac = 4 - (-4) = 8$

ب) $x^2 + x - 4 = 0 \quad x = \frac{-1 \pm \sqrt{17}}{2} \quad x_1 = \frac{-1 + \sqrt{17}}{2} \quad x_2 = \frac{-1 - \sqrt{17}}{2}$

$\Delta = b^2 - 4ac = 1 - (-16) = 17$

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الف) $x^2 - 11x + 28 = 0$

$(x-4)(x-7) \longrightarrow x=4 \quad x=7$

ب) $x^2 + 3x - 28 = 0$

$(x+7)(x-4) \longrightarrow x=-7 \quad x=4$

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الف) $5x^2 - 11x + 2 = 0$

$x^2 - 11x + 10 = 0$

$(x-5)(x-1) = 0 \longrightarrow x = \frac{5}{5} = 1 \quad x = \frac{1}{5}$

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ب) $3x^2 - 10x + 1 = 0$

$x^2 - 10x + 21 = 0$

$(x-7)(x-3) = 0 \longrightarrow x = \frac{7}{1} = 7 \quad , \quad x = \frac{3}{1} = 3$

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الف) $2x^2 - 5x + 3 = 0$

$a+b+c=0 \qquad x=1 \qquad x = \frac{c}{a} = \frac{3}{2}$

ب) $2x^2 + 5x + 3 = 0$

$a+c=b \qquad x=-1 \qquad x = -\frac{c}{a} = \frac{-3}{2}$

ج) $2x^2 - 5x + 1 = 0 \qquad \Delta = b^2 - 4ac = (-5)^2 - 8 = 25 - 8 = 17 \qquad x = \frac{5 \pm \sqrt{17}}{4} \longrightarrow x_1 = \frac{5+\sqrt{17}}{2} \; , \; x_2 = \frac{5-\sqrt{17}}{2}$

د) $2x^2 + 7x + 9 = 0 \qquad \Delta = b^2 - 4ac = 49 - 144 = -95 < 0$

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$x^2 - 3x - 4 = 0$

$S = \frac{-b}{a} = \frac{-(-3)}{1} = 3$

$P = \frac{c}{a} = -4$

$S^2 - 2P = 9 - (-8) = 17$

$S^3 - 3SP = 27 - (-18) = 45$

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الف) $\binom{7}{5} + \binom{9}{2} = \frac{7 \times 6}{2} + \frac{9 \times 8}{2} = 21 + 36 = 57$

ب) $\binom{9}{3} - \binom{8}{2} = \frac{8 \times 7 \times 6}{3 \times 2} - \frac{8 \times 7}{2} = 84 - 28 = 56$