نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ..... کلاس .....

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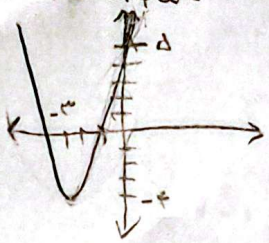
الف) $y = x^2 + 6x + 5 \quad a>0 \rightarrow \min \left| \begin{array}{l} \frac{-b}{2a} = \frac{-6}{2} = -3 \\ (-3)^2 + 6(-3) + 5 = 9 - 18 + 5 = -4 \end{array} \right.$

$\min = \left| \begin{array}{l} -3 \\ -4 \end{array} \right.$ (مینیمم)

ب)



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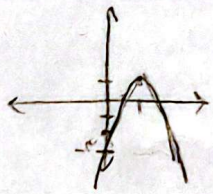
الف) $y = -x^2 + 4x - 3 \quad a<0 \rightarrow \max \left| \begin{array}{l} \frac{-b}{2a} = \frac{-4}{-2} = 2 \\ -4 + 8 - 3 = 1 \end{array} \right.$

$\max = \left| \begin{array}{l} 2 \\ 1 \end{array} \right.$



ب) $0 = -x^2 + 4x - 3 \rightarrow \frac{-1}{-1} = \frac{-(x^2 - 4x + 3)}{-1} \rightarrow 1 = (x-2)^2 \rightarrow 1 = |x-2|$

$\rightarrow \left| \begin{array}{l} x = 3 \\ x = 1 \end{array} \right.$

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$2x^2 - 4x + a = 0 \quad \Delta = b^2 - 4ac = 9 - 8a$

الف) $\Delta > 0 \rightarrow 9 - 8a > 0 \rightarrow -8a > -9 \rightarrow a < \frac{9}{8}$

ب) $\Delta = 0 \rightarrow a = \frac{9}{8}$

ج) $\Delta < 0 \rightarrow a > \frac{9}{8}$

د) $\Delta \geq 0 \rightarrow a \leq \frac{9}{8}$

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الف) $x^2 - 2x - 1 = 0 \xrightarrow{+2} x^2 - 2x + 1 = 2 \rightarrow (x-1)^2 = 2 \rightarrow |x-1| = \sqrt{2} \rightarrow \left| \begin{array}{l} x - 1 = \sqrt{2} \rightarrow x = 1 + \sqrt{2} \\ x - 1 = -\sqrt{2} \rightarrow x = 1 - \sqrt{2} \end{array} \right.$

ب) $x^2 - x - 1 = 0 \xrightarrow{+\frac{5}{4}} x^2 - x + \frac{1}{4} = \frac{5}{4} \rightarrow (x - \frac{1}{2})^2 = \frac{5}{4} \rightarrow |x - \frac{1}{2}| = \frac{\sqrt{5}}{2}$

$\left| \begin{array}{l} x - \frac{1}{2} = \frac{\sqrt{5}}{2} \rightarrow x = \frac{\sqrt{5}+1}{2} \\ x - \frac{1}{2} = -\frac{\sqrt{5}}{2} \rightarrow x = \frac{1-\sqrt{5}}{2} \end{array} \right.$

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الف) $x^2 - 2x - 1 = 0 \quad \Delta = b^2 - 4ac = 4 + 4 = 8 \quad x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{2 \pm 2\sqrt{2}}{2} = \frac{2(1 \pm \sqrt{2})}{2}$

$= 1 \pm \sqrt{2}$

ب) $x^2 + x - 4 = 0 \quad \Delta = 1 + 16 = 17 \quad x = \frac{-1 \pm \sqrt{17}}{2}$

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الف) $x^2 - 11x + 28 = 0 \rightarrow (x-4)(x-7) = 0 \rightarrow x = 7 \text{ , } x = 4$

ب) $x^2 + 3x - 28 = 0 \rightarrow (x-4)(x+7) = 0 \rightarrow x = -7 \text{ , } x = 4$

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الف) $5x^2 - 12x + 7 = 0 \rightarrow x^2 - 12x + 35 = 0 \rightarrow (x-7)(x-5) = 0 \begin{cases} x = \frac{7}{5} \\ x = \frac{5}{5} = 1 \end{cases}$

ب) $3x^2 - 10x + 7 = 0 \rightarrow x^2 - 10x + 21 \rightarrow (x-7)(x-3) = 0 \begin{cases} x = \frac{7}{3} \\ x = \frac{3}{3} = 1 \end{cases}$

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الف) $2x^2 - 5x + 3 = 0 \rightarrow x^2 - 5x + 6 = 0 \rightarrow (x-3)(x-2) = 0 \begin{cases} x = \frac{3}{2} \\ x = \frac{2}{2} = 1 \end{cases}$

ب) $2x^2 + 5x + 3 = 0 \rightarrow x^2 + 5x + 6 = 0 \rightarrow (x+3)(x+2) = 0 \begin{cases} x = -\frac{3}{2} \\ x = \frac{-2}{2} = -1 \end{cases}$

ج) $2x^2 - 5x + 1 = 0 \quad \Delta = 25 - 8 = 17 \rightarrow x = \frac{5 \pm \sqrt{17}}{4}$

د) $6x^2 + 7x + 9 = 0 \quad \Delta = 49 - 144 \rightarrow \Delta < 0 \rightarrow$ ریشه ندارد / معادله جواب ندارد

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

$S = \text{مجموع ریشه‌ها} = \frac{-b}{a} = \frac{3}{1} = 3$

$P = \text{ضرب ریشه‌ها} = \frac{c}{a} = \frac{-2}{1} = -2$

الف) $S^2 - 2P = 9 + 4 = 13$

ب) $S^3 - 3SP = 27 + 18 = 45$

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الف) $\binom{5}{2} + \binom{6}{4} = \frac{5 \times 4 \times 3 \times 2 \times 1}{2 \times 1 \times 3 \times 2 \times 1} + \frac{6 \times 5 \times 4 \times 3}{4 \times 3 \times 2 \times 1} = 21 + 36 = 57$

ب) $\binom{9}{3} - \binom{7}{2} = \frac{9 \times 8 \times 7}{3 \times 2 \times 1} - \frac{7 \times 6}{2} = 84 - 21 = 63$