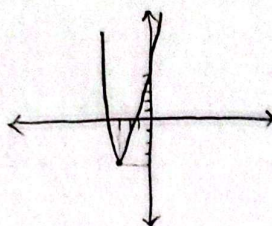


$$y = x^2 + 4x + 20$$

$$\text{Min} \left| \begin{array}{l} -\frac{b}{2a} = -\frac{4}{2} = -2 \\ -\frac{\Delta}{4a} = -\frac{16}{4} = -4 \end{array} \right.$$

$$\Delta = b^2 - 4ac = 16 - 4(20) = 16 - 80 = -64$$



(الف)

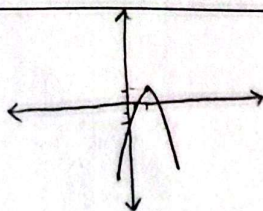
(ب)

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

$$\text{Max} \left| \begin{array}{l} -\frac{b}{2a} = -\frac{4}{-2} = +2 \\ -\frac{\Delta}{4a} = -\frac{4}{-4} = +1 \end{array} \right.$$

$$\Delta = b^2 - 4ac = 16 - 4(-1)(-3) = 16 - 12 = 4$$



(الف)

(ب)

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$$-x^2 + 4x - 3 = 0 \\ x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{-4 \pm \sqrt{4}}{-2} = \begin{cases} +2 \\ +3 \end{cases}$$

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

$$\Delta = b^2 - 4ac = 9 - 4(2)(a) = 9 - 8a \quad 9 - 8a > 0 \quad \frac{9}{8} > \frac{8a}{8} \quad \frac{9}{8} > a \quad \text{(الف)}$$

$$9 - 8a = 0 \quad a = \frac{9}{8} \quad \frac{9}{8} = a \quad \text{(ب)}$$

$$9 - 8\left(\frac{9}{8}\right) = 9 - 9 = 0$$

$$\frac{9}{8} = a$$

$$9 - 8a < 0 \rightarrow \frac{9}{8} < \frac{8a}{8} \rightarrow \frac{9}{8} < a \quad \text{رابطه معکوس باشد} \quad \frac{9}{8} < a \quad \text{(ج)}$$

$$\frac{9}{8} \geq a \quad \text{(د)}$$

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$$\text{الف) } x^2 - 2x - 1 = 0 \rightarrow x^2 - 2x + 1 = 2 \rightarrow (x-1)^2 = 2 \quad x-1 = \pm\sqrt{2} \quad x = 1 \pm \sqrt{2}$$

$$\text{ب) } x^2 - x - 1 = 0 \rightarrow x^2 - x + \frac{1}{4} = \frac{5}{4} \quad \left(x - \frac{1}{2}\right)^2 = \frac{5}{4} \quad x = \begin{cases} \frac{1}{2} + \frac{\sqrt{5}}{2} \\ \frac{1}{2} - \frac{\sqrt{5}}{2} \end{cases}$$

$$x - \frac{1}{2} = \pm\sqrt{\frac{5}{4}}$$

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$$\text{الف) } x^2 - 2x - 1 = 0$$

$$x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{2 \pm \sqrt{8}}{2} = \begin{cases} \frac{2 + \sqrt{8}}{2} = 1 + \sqrt{2} \\ \frac{2 - \sqrt{8}}{2} = 1 - \sqrt{2} \end{cases}$$

$$\Delta = b^2 - 4ac = 4 - 4(-1) = 4 + 4 = 8$$

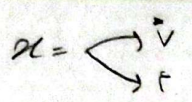
$$\text{ب) } x^2 + x - 5 = 0$$

$$x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{-1 \pm \sqrt{21}}{2} = \begin{cases} \frac{-1 + \sqrt{21}}{2} \\ \frac{-1 - \sqrt{21}}{2} \end{cases}$$

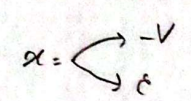
$$\Delta = b^2 - 4ac = 1 - 4(-5) = 1 + 20 = 21$$

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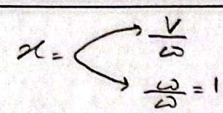
الف) $x^2 - 11x + 28 = 0 \rightarrow (x-7)(x-4) = 0$



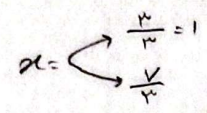
ب) $x^2 + 3x - 28 = 0 \rightarrow (x+7)(x-4) = 0$



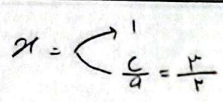
الف) $\omega x^2 - 12x + 7 = 0 \rightarrow x^2 - 12x + 28 = 0 \rightarrow (x-7)(x-4) = 0$



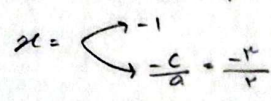
ب) $3x^2 - 10x + 7 = 0 \rightarrow x^2 - 10x + 21 = 0 \rightarrow (x-7)(x-3) = 0$



الف) $2x^2 - 5x + 3 = 0$



ب) $2x^2 + 5x + 3 = 0$



ج) $2x^2 - 5x + 1 = 0$

$x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{5 \pm \sqrt{17}}{4}$

$\Delta = b^2 - 4ac = 25 - 4(2)(1) = 25 - 8 = 17$

د) $4x^2 + 7x + 9 = 0$

$x = \frac{-b \pm \sqrt{\Delta}}{2a} =$

$\Delta = b^2 - 4ac = 49 - 4(4)(9) = \Delta$

جواب ندارد چون دلتا منفی است

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

$S = \frac{-b}{a} \quad P = \frac{c}{a}$

الف) $S - 2P = (\frac{3}{1})^2 - 2(\frac{-2}{1}) = 9 + 4 = 13$

ب) $S - 3SP = (\frac{3}{1})^3 - 3(\frac{3}{1})(\frac{-2}{1}) = 27 + 18 = 45$

الف) $\binom{7}{2} + \binom{9}{2} = \frac{7 \times 6}{2 \times 1} + \frac{9 \times 8}{2 \times 1} = 21 + 36 = 57$

ب) $\binom{9}{2} - \binom{7}{2} = \frac{9 \times 8}{2 \times 1} - \frac{7 \times 6}{2 \times 1} = 36 - 21 = 15$