

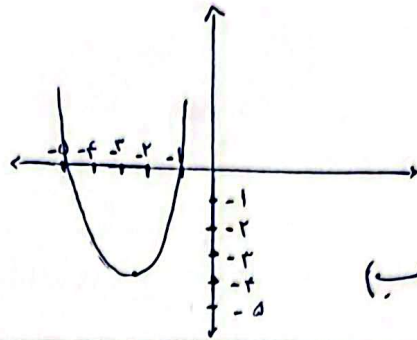
$$y = x^2 + 4x + 5$$

$$\left| \frac{-b}{2a} \right| \rightarrow \frac{-4}{2} = -2$$

$$\left| \frac{-b}{2a} \right| \rightarrow y = (-2)^2 + 4(-2) + 5 = -1$$

$$y = 0 \rightarrow x^2 + 4x + 5 = 0 \rightarrow x = -1$$

$$a + c = b \rightarrow x = -\frac{c}{a}$$



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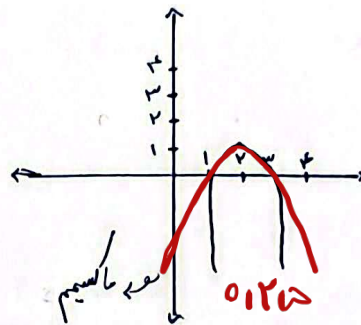
$$y = -x^2 + 4x - 3$$

$$\left| \frac{-b}{2a} \right| \rightarrow \frac{-4}{-2} = 2$$

$$\left| \frac{-b}{2a} \right| \rightarrow -4 + 4 - 3 = -3$$

$$y = 0 \rightarrow -x^2 + 4x - 3 = 0 \rightarrow x = 1$$

$$a + b + c = 0 \rightarrow x = \frac{c}{a}$$



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$$2x^2 - 3x + a = 0, \Delta = b^2 - 4ac$$

$$b^2 - 4ac > 0 \rightarrow 9 - 4(2)(a) = 9 - 8a > 0 \rightarrow 9 > 8a \rightarrow a < \frac{9}{8}$$

$$b^2 - 4ac = 0 \rightarrow 9 - 4(2)(a) = 0 \rightarrow 9 - 8a = 0 \rightarrow 9 = 8a \rightarrow a = \frac{9}{8}$$

$$b^2 - 4ac < 0 \rightarrow 9 - 4(2)(a) = 9 - 8a < 0 \rightarrow 9 < 8a \rightarrow a > \frac{9}{8}$$

$$\Delta = b^2 - 4ac \geq 0 \rightarrow 9 - 4(2)(a) = 9 - 8a \geq 0 \rightarrow 9 \geq 8a \rightarrow a \leq \frac{9}{8}$$

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

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

$$(x-0)^2 = x^2 - 2 \times x \times 0 + 0^2$$

$$x \times 0 = x \rightarrow 0 = \frac{1}{4} \rightarrow (\frac{1}{4})^2 = \frac{1}{16}$$

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$$\text{الف) } x^2 - 2x - 1 = 0, x = \frac{-b \pm \sqrt{\Delta}}{2a}, \Delta = b^2 - 4ac$$

$$L \rightarrow x = \frac{2 \pm \sqrt{4 + 4}}{2} = \frac{2 \pm \sqrt{8}}{2} = \frac{2 \pm 2\sqrt{2}}{2} \rightarrow \begin{cases} x = 1 + \sqrt{2} \\ x = 1 - \sqrt{2} \end{cases}$$

$$\text{ب) } x^2 + x - 4 = 0$$

$$L \rightarrow x = \frac{-1 \pm \sqrt{1 + 16}}{2} = \frac{-1 \pm \sqrt{17}}{2} \rightarrow \begin{cases} x = \frac{-1 + \sqrt{17}}{2} \\ x = \frac{-1 - \sqrt{17}}{2} \end{cases}$$

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

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

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

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

$$\text{الف) } 2x^2 - 5x + 3 = 0 \rightarrow x^2 - 5x + 9 = 0 \rightarrow (x-2)(x-3) = 0 \rightarrow \begin{cases} x = \frac{2}{2} = 1 \\ x = \frac{3}{2} = \frac{3}{2} \end{cases}$$

$$\text{ب) } 2x^2 + 5x + 3 = 0 \rightarrow x^2 + 5x + 9 = 0 \rightarrow (x+2)(x+3) = 0 \rightarrow \begin{cases} x = -\frac{2}{2} = -1 \\ x = -\frac{3}{2} = -\frac{3}{2} \end{cases}$$

$$\text{ج) } 2x^2 - 5x + 1 = 0 \rightarrow \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \Rightarrow \frac{5 \pm \sqrt{25 - 8}}{4} \Rightarrow \begin{cases} x = \frac{5 - \sqrt{17}}{4} \\ x = \frac{5 + \sqrt{17}}{4} \end{cases}$$

$$\text{د) } 4x^2 + 7x + 9 = 0 \rightarrow \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \Rightarrow \frac{-7 \pm \sqrt{49 - 144}}{8} \rightarrow \Delta < 0 \rightarrow \text{عادله ریشه حقیقی ندارد}$$

$$x^2 - 3x - 2 = 0 \rightarrow \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{3 \pm \sqrt{9 + 8}}{2} \Rightarrow \begin{cases} x = \frac{3 + \sqrt{17}}{2} \\ x = \frac{3 - \sqrt{17}}{2} \end{cases}$$

$$S = \frac{3 + \sqrt{17}}{2} + \frac{3 - \sqrt{17}}{2} = \frac{3 + \sqrt{17} + 3 - \sqrt{17}}{2} = \frac{6}{2} = 3$$

$$P = \left(\frac{3 + \sqrt{17}}{2}\right) \left(\frac{3 - \sqrt{17}}{2}\right) = \frac{(3)^2 - (\sqrt{17})^2}{(2)^2} = \frac{9 - 17}{4} = \frac{-8}{4} = -2$$

$$\text{الف) } S^2 - 2P = 3^2 - 2(-2) = 9 + 4 = 13 \quad \checkmark$$

$$\text{ب) } S^3 - 3S^2P = 3^3 - 3(3)(-2) = 27 + 18 = 45 \quad \checkmark$$

$$\text{الف) } \begin{pmatrix} 7 \\ 5 \end{pmatrix} + \begin{pmatrix} 9 \\ 2 \end{pmatrix} = \begin{pmatrix} 16 \\ 7 \end{pmatrix}$$

$$\text{ب) } \begin{pmatrix} 9 \\ 3 \end{pmatrix} + \begin{pmatrix} 1 \\ 2 \end{pmatrix} = \begin{pmatrix} 10 \\ 5 \end{pmatrix}$$