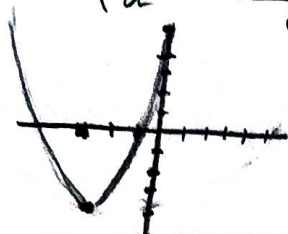


ext $\left| \begin{array}{l} \frac{-b}{2a} = \frac{-(-6)}{2} = 3 \\ \frac{-\Delta}{4a} = \frac{-(b^2 - 4ac)}{4a} = \frac{-(36 - 4 \times 1 \times 5)}{4} = -4 \end{array} \right. \begin{Bmatrix} -3 \\ -4 \end{Bmatrix}$

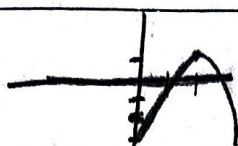


$a > 0$
min

الف

ب

ext $\left| \begin{array}{l} \frac{-b}{2a} = \frac{-(-6)}{-2} = 3 \\ \frac{-\Delta}{4a} = \frac{-(b^2 - 4ac)}{4a} = \frac{-(16 - 4 \times 1 \times (-3))}{-4} = 1 \end{array} \right. \begin{Bmatrix} 3 \\ 1 \end{Bmatrix}$



$a < 0$
max

الف

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$\Delta = 4 - 4 \times 1 \times (-3) = 16$

$x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{-(-6) \pm 4}{-2} = 1, 3 \Rightarrow x = 1, 3$

$\Delta > 0 \Rightarrow b^2 - 4ac > 0 \Rightarrow 9 - 4 \times 1 \times a > 0 \Rightarrow \{a \leq 9/4 \mid a \in \mathbb{R}\}$ (الف)

$\Delta = 0 \Rightarrow b^2 - 4ac = 0 \Rightarrow 9 - 4a = 0 \Rightarrow a = \{9/4\}$ (ب)

$\Delta < 0 \Rightarrow b^2 - 4ac < 0 \Rightarrow 9 - 4a < 0 \Rightarrow a \in \{a \in \mathbb{R} \mid a > 9/4\}$ (ج)

$\Delta \geq 0 \Rightarrow b^2 - 4ac \geq 0 \Rightarrow 9 - 4a \geq 0 \Rightarrow a \in \{a \in \mathbb{R} \mid a \leq 9/4\}$ (د)

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الف $x^2 - 2x - 1 = 0$

$x^2 - 2x + 1 = 2$

$(x - 1)^2 = 2$

$x - 1 = \pm \sqrt{2}$

$x = \sqrt{2} + 1$ و $-\sqrt{2} + 1$

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

ب $x^2 + x - 1 = 0$

$2x \times \square = -x$

$\square = \frac{-1}{2} = -\frac{1}{2}$

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

$(x - \frac{1}{2})^2 = \frac{\Delta}{4} \Rightarrow x - \frac{1}{2} = \pm \sqrt{\frac{\Delta}{4}}$

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

د طرف را با هم

تکثیر

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الف $x^2 - 2x - 1 = 0 \Rightarrow \Delta = b^2 - 4ac = 4 - 4 \times 1 \times (-1) = 8$

$x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{2 \pm 2\sqrt{2}}{2} = 1 \pm \sqrt{2} \Rightarrow x = 1 \pm \sqrt{2}$

ب $x^2 + x - 1 = 0 \Rightarrow \Delta = b^2 - 4ac = 1 - 4 \times 1 \times (-1) = 5$

$x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{-1 \pm \sqrt{5}}{2}$

$$x^2 - 11x + 21 = 0$$

$$(x-4)(x-7) = 0 \quad x = 4, 7$$

(الف)

$$x^2 + 3x - 21 = 0 \quad (x+7)(x-3) \quad x = -7, 3$$

(ب)

$$ax^2 - 12x + 5 = 0 \Rightarrow x^2 - 12x + 35 = 0$$

$$(x-5)(x-7) \Rightarrow x = \frac{5}{a} \text{ و } \frac{7}{a} \Rightarrow 1, \frac{7}{5}$$

(الف)

$$3x^2 - 10x + 5 = 0 \Rightarrow x^2 - 10x + 21 = 0$$

(ب)

$$(x-3)(x-7) = 0$$

$$x = \frac{3}{3} \text{ و } \frac{7}{3} \Rightarrow 1, \frac{7}{3}$$

$$2x^2 - 5x + 3 = 0 \Rightarrow x^2 - 5x + 6 = 0$$

$$(x-2)(x-3) \Rightarrow x = \frac{2}{2}, \frac{3}{2} \Rightarrow 1, \frac{3}{2}$$

$$\text{ج) } 2x^2 - 4x + 1 = 0 \Rightarrow \Delta = b^2 - 4ac$$

$$= 16 - 4 = 12$$

$$x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{4 \pm \sqrt{12}}{4}$$

$$\text{د) } 2x^2 + 4x + 3 = 0 \Rightarrow x^2 + 2x + 1.5 = 0$$

$$(x+1)(x+3) \Rightarrow x = -1, -3$$

$$\text{ه) } 5x^2 + 7x + 9 = 0$$

$$\Delta = b^2 - 4ac = 49 - 180 = -131$$

$\Delta < 0 \Rightarrow$ جواب ندارد

حاصل جمع شده $\Rightarrow s = \frac{-b}{a} = 3$

حاصل ضرب شده $\Rightarrow p = \frac{c}{a} = -2$

$$s^2 - 2p = 9 + 4 = 13$$

$$s^3 - 3sp = 27 - 3 \times 3 \times (-2) = 45$$

$$\text{الف) } \binom{7}{5} + \binom{9}{2} \Rightarrow \frac{7!}{5!2!} + \frac{9!}{2!7!} = 21 \Rightarrow 3^4 + 21 = 81$$

$$\frac{9!}{5!4!} = 9 \times 1^6 \times 1^4 = 36$$

$$\frac{1!}{6! \times 2!} = \frac{1}{720 \times 2} = \frac{1}{1440}$$

$$\frac{1^6 \times 1^6 \times 1^4}{6! \times 2!} = \frac{1}{1440}$$

$$\text{د) } \binom{9}{3} - \binom{1}{2} \Rightarrow \frac{9!}{3!6!} - \frac{1!}{2!1!} = 120 - 1 = 119$$

$$119 - 21 = 98$$