

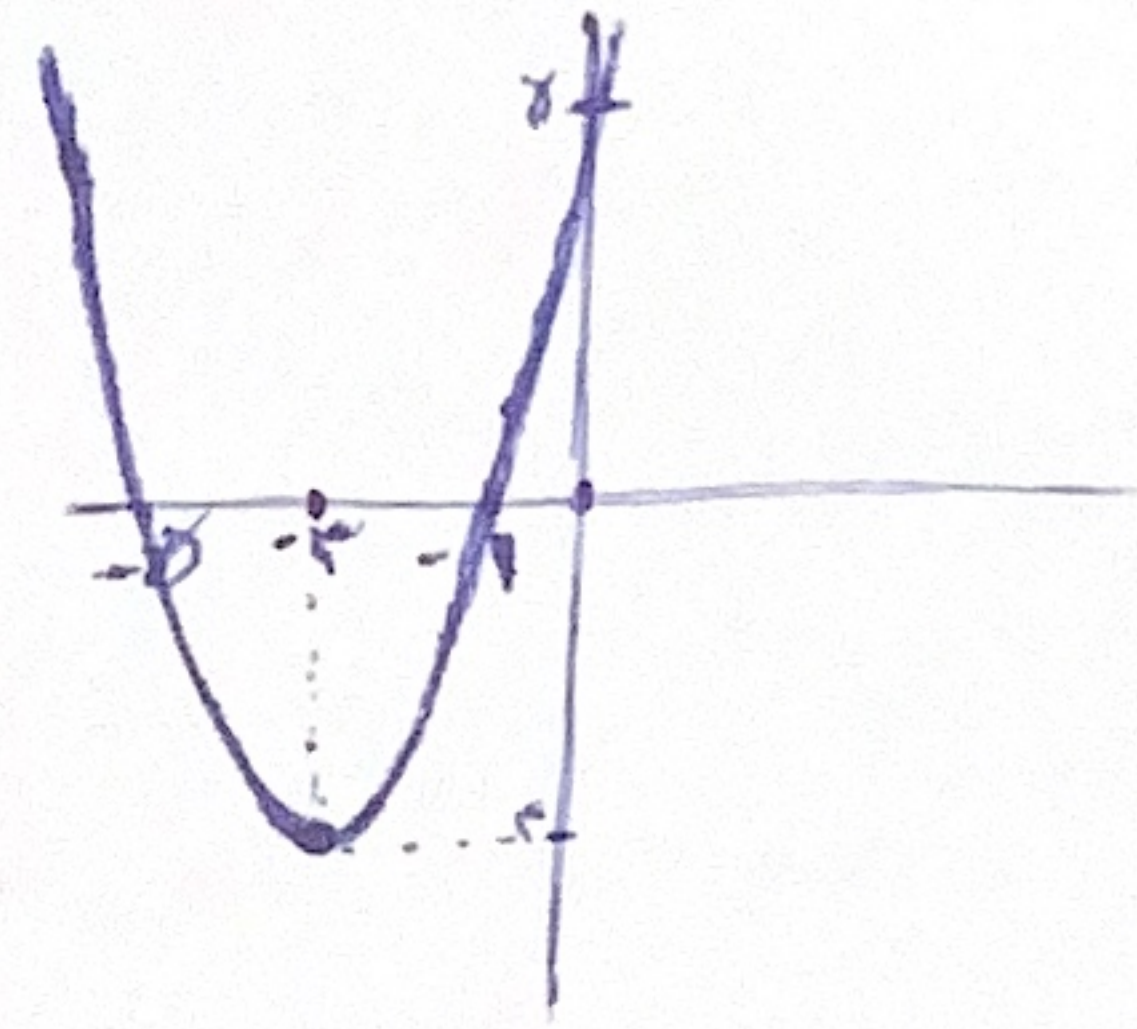
الف) $a \rightarrow \text{منبت} \Rightarrow \min$ | -۳

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

$$(-2)^2 + 4(-2) + 8 = -4$$

ب)

$$\{ \text{منبت} \rightarrow a+c=b \Rightarrow x = -\frac{c}{a} = -1 \quad -\frac{c}{a} = -4$$



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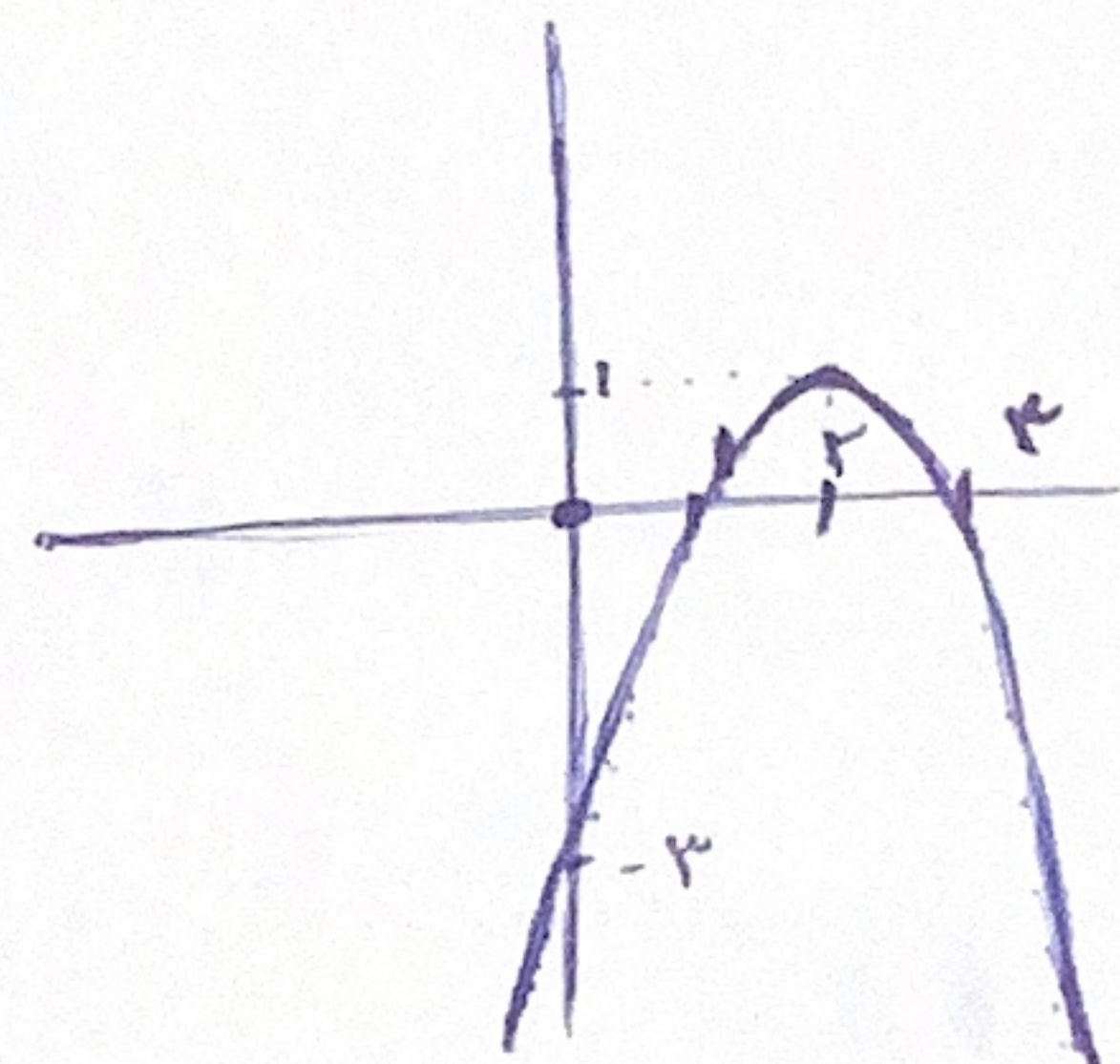
الف) $a \rightarrow \text{منبت} \Rightarrow \max$ | ۲

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

$$-2^2 + 8 - 3 = 1$$

ب) ۱، ۲، ۳

$$\{ \text{منبت} \rightarrow a+b+c=0 \Rightarrow x = 1, \frac{c}{a} = 3$$



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الف) $\Delta > 0 \Rightarrow b^2 - 4ac > 0 \Rightarrow 9 - 4a > 0 \Rightarrow 9 > 4a \Rightarrow \frac{9}{4} > a \Rightarrow (-\infty, \frac{9}{4}) = a$

ب) $\Delta = 0 \Rightarrow b^2 - 4ac = 0 \Rightarrow 9 - 4a = 0 \Rightarrow 9 = 4a \Rightarrow \frac{9}{4} = a \Rightarrow [\frac{9}{4}] = a$

ج) $\Delta < 0 \Rightarrow b^2 - 4ac < 0 \Rightarrow 9 - 4a < 0 \Rightarrow 9 < 4a \Rightarrow \frac{9}{4} < a \Rightarrow (\frac{9}{4}, \infty) = a$

د) $\Delta \geq 0 \Rightarrow b^2 - 4ac \geq 0 \Rightarrow 9 - 4a \geq 0 \Rightarrow 9 \geq 4a \Rightarrow \frac{9}{4} \geq a \Rightarrow (-\infty, \frac{9}{4}] = a$

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

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

$$x^2 = a^2, -x = 2ab \Rightarrow x = a, -1 = 2b$$

ب) $x^2 - x - 1$

$$\Rightarrow -\frac{1}{x} = b \quad (x - \frac{1}{x})^2 = x^2 - x + \frac{1}{x^2}$$

$$\Rightarrow x^2 - x + \frac{1}{x^2} + (x - \frac{1}{x})^2 = 0 \Rightarrow (x - \frac{1}{x})^2 = \frac{8}{x^2} \Rightarrow x - \frac{1}{x} = \pm \frac{\sqrt{8}}{x} \Rightarrow x = \frac{1}{x} \pm \frac{\sqrt{8}}{x}$$

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

$$x = \frac{-b \pm \sqrt{\Delta}}{2a} \Rightarrow x = \frac{-(-2) \pm \sqrt{8}}{2} = \frac{2 \pm \sqrt{8}}{2} = 1 \pm \sqrt{2} \Rightarrow x = 1 \pm \sqrt{2}$$

ب) $\Delta = 1 - 4(-4) = 1 - (-16) = 17$

$$\frac{-1 \pm \sqrt{17}}{2} = x \Rightarrow x = \frac{-1}{2} \pm \frac{\sqrt{17}}{2}$$

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

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

الف) $8x^2 - 12x + 5 = 0 \Rightarrow x^2 - 1.5x + 0.625 = 0$

$\Rightarrow (x-0.5)(x-1.25) = 0 \Rightarrow x = \frac{1}{2}, \frac{5}{4}$

ب) $3x^2 - 10x + 7 = 0 \Rightarrow x^2 - 3.33x + 2.33 = 0$

$\Rightarrow (x-1)(x-2.33) = 0 \Rightarrow x = 1, \frac{7}{3}$

الف) $2x^2 - 8x + 6 = 0 \quad a+b+c=0 \Rightarrow x=1, \frac{c}{a} \Rightarrow x=1, \frac{3}{2}$

ب) $2x^2 + 8x + 6 = 0 \quad a+c=b \Rightarrow x=(-1), -\frac{c}{a} \Rightarrow x=(-1), -\frac{3}{2}$

ج) $2x^2 - 8x + 6 = 0 \quad \Delta = b^2 - 4ac = 64 - 48 = 16 \quad \frac{-b \pm \sqrt{\Delta}}{2a} = x$

$(-8) \pm \sqrt{16} = 2x \Rightarrow x = \frac{-(-8) \pm \sqrt{16}}{2 \times 2} = \frac{8 \pm 4}{4} = \frac{12}{4} = 3, \frac{4}{4} = 1$

د) $4x^2 + 4x + 9 = 0 \quad \Delta = 16 - 144 = -128 \rightarrow$ دلا زير، اديكوان منفي است، جواب حقيقي ندارد

$x^2 - 3x - 2 = 0 \quad \frac{-b}{a} = 3, \frac{c}{a} = -2 \quad \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = x$

الف) $\left(\frac{-b}{a}\right)^2 - 4 \frac{c}{a} = 3^2 - (-4) = 9 + 4 = 13$

ب) $\left(\frac{-b}{a}\right)^2 - 4 \left(\frac{c}{a} \times \frac{-b}{a}\right) = 3^2 - 4 \left(-\frac{6}{4}\right) = 9 - (-6) = 15$

الف) $\binom{5}{2} = \frac{5!}{(5-2)! \times 2!} = \frac{5 \times 4 \times 3 \times 2 \times 1}{2 \times 1 \times 2 \times 1} = 10$

$21 + 34 = 55$

ب) $\binom{9}{2} = \frac{9!}{(9-2)! \times 2!} = \frac{9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1}{2 \times 1 \times 2 \times 1} = 36$

$\binom{9}{3} = \frac{9!}{(9-3)! \times 3!} = \frac{9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1}{6 \times 2 \times 1 \times 2 \times 1 \times 2 \times 1} = 84$

$\binom{11}{2} = \frac{11!}{(11-2)! \times 2!} = \frac{11 \times 10 \times 9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1}{2 \times 1 \times 2 \times 1} = 55$

$14 - 21 = -7$