

کتاب

A

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1, 2

$$x^2 - 5x + 2 = 0$$

$$\alpha + \beta = 5, \alpha\beta = 2$$

$$\beta^2 = 2\alpha - 1$$

$$\beta^2 = 10\alpha - 22$$

$$\beta^2 = 2\alpha - 1$$

$$2\alpha + \beta^2 = 2(\alpha - \beta) + 2\alpha - 1 = 4\alpha - 2\beta - 1$$

$$2\alpha + \beta^2 = 2\alpha - 1$$

$$\frac{2\alpha + \beta^2}{2\alpha} = \frac{2\alpha - 1}{2\alpha} = 1$$

✓

$$x_{\text{avg}} = \frac{5 + (-1/5)}{2} = \frac{10 - 1}{10} = \frac{9}{10}$$

$$\text{ext} \left| \begin{array}{l} -\frac{b}{2a} = \frac{5}{2} \\ y = -\frac{\Delta}{4a} \end{array} \right.$$

$$-\frac{b}{2a} = \frac{5}{2} \times 2 = 5$$

✓

$$|\alpha - \beta| = \frac{\sqrt{b^2 - 4ac}}{2a}$$

$$|\alpha - \beta| = \sqrt{(2K)^2 - 2} = \sqrt{4K^2 - 2} = \frac{2}{K}$$

$$2 \times 2K^2 - 2 = \frac{4}{K^2} \Rightarrow 4K^2 - 2 = \frac{4}{K^2}$$

$$4K^4 - 2K^2 = 4 \Rightarrow 4K^4 - 2K^2 - 4 = 0$$

$$2K^2 = 4 \Rightarrow K^2 = 2 \Rightarrow K = \sqrt{2}$$

$$\frac{K^2}{2} = \frac{2}{2} = 1 \Rightarrow \left[\frac{K^2}{2} \right] = \left[\frac{2}{2} \right] = 1$$

✓

$$x_{\text{avg}} = \frac{5 + (-5)}{2} = -1$$

$$\alpha + \beta = 2x_{\text{avg}} = -2$$

$$\alpha^2 + \beta^2 = (\alpha + \beta)^2 - 2\alpha\beta = 4$$

$$(-2)^2 - 2\alpha\beta = 4$$

$$4 - 2\alpha\beta = 4 \Rightarrow \alpha\beta = 0$$

$$x^2 - (\alpha + \beta)x + \alpha\beta = 0$$

$$x^2 - (-2)x - \frac{1}{2} = 0$$

$$x^2 + 2x - \frac{1}{2} = 0$$

$$x = \frac{-2 \pm \sqrt{2^2 - 4 \times (-1/2)}}{2} = \frac{-2 \pm \sqrt{4 + 2}}{2} = \frac{-2 \pm \sqrt{6}}{2} = -1 \pm \frac{\sqrt{6}}{2}$$

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ساده

$$(y-1) = a(n+1)^2 \Rightarrow$$

$$\frac{a+1}{a} = \frac{1}{2} \Rightarrow a = \frac{2}{1}$$

$$\Delta = (-5)^2 - 4 \times 1 \times (-m) = 25 + 4m \geq 0 \Rightarrow m \geq -\frac{25}{4}$$

$$x_{\text{max}} = \frac{5 + \sqrt{25 + 4m}}{2} < \frac{9}{2}$$

$$5 + \sqrt{25 + 4m} < 9$$

$$\sqrt{25 + 4m} < 4$$

$$25 + 4m < 16 \Rightarrow 4m < -9 \Rightarrow m < -\frac{9}{4}$$

$$\rightarrow -\frac{25}{4} \leq m < -\frac{9}{4} \Rightarrow m = -4, -5, -6, -7$$

✓

$$y = mx^2 - 12x + (5m - 1)$$

$$x_{\text{avg}} = -\frac{b}{2a} = -\frac{-12}{2m} = \frac{12}{2m} = \frac{6}{m}$$

$$y_{\text{min}} = m\left(\frac{6}{m}\right)^2 - 12 \times \frac{6}{m} + (5m - 1) = 1$$

$$m \times \frac{36}{m^2} - \frac{72}{m} + 5m - 1 = 1$$

$$\frac{36 - 72}{m} + 5m - 1 = 1 \Rightarrow \frac{-36}{m} + 5m - 1 = 1$$

$$5m - \frac{36}{m} = 2$$

$$5m^2 - 36 = 2m \Rightarrow 5m^2 - 2m - 36 = 0$$

$$m = \frac{2 \pm \sqrt{4 + 720}}{10} = \frac{2 \pm \sqrt{724}}{10} = \frac{2 \pm 2\sqrt{181}}{10}$$

$$m = \frac{2}{10} = \frac{1}{5}$$

$$m = \frac{-2}{10} = -\frac{1}{5}$$

✓

$$x = \frac{6}{m} \begin{cases} m = \frac{1}{5} \rightarrow x = 6 \\ m = -\frac{1}{5} \rightarrow x = -6 \end{cases}$$

شماره جدید و بهینه برای
a=1 بررسی کن

$$x^2 + 2(a+1)x + (2a-1) = 0$$

$$\alpha, \alpha, \beta : \text{ریشه ها} \rightarrow \alpha\beta = \alpha^2, \alpha\beta = 2a-1$$

$$\alpha^2 = 2a-1 \rightarrow \alpha^2 - 2a + 1 = 0$$

$$(a-1)^2 = 0 \rightarrow a=1$$

۵. $m^2 + 4m + 1 = 0 \rightarrow$

$$x^2 - vx - a = 0 \xrightarrow{y=x^2} y^2 - vy - a = 0$$

$$x_1 = \sqrt{\frac{v+\sqrt{v^2+4a}}{2}}, x_2 = \sqrt{\frac{v+\sqrt{v^2+4a}}{2}}$$

$$S = x_1 + x_2 = 0$$

$$P = x_1 x_2 = -\frac{v+\sqrt{v^2+4a}}{2}$$

$$y = \frac{v \pm \sqrt{v^2+4a}}{2} = \frac{v \pm \sqrt{4a}}{2}$$

$$y_1 = \frac{v+\sqrt{4a}}{2} > 0 \rightarrow x = \pm \sqrt{y_1}$$

$$y_2 = \frac{v-\sqrt{4a}}{2} < 0 \quad x$$

$$2p^2 - 2p + 2s^2$$

$$2p^2 = 2\left(-\left(\frac{v+\sqrt{4a}}{2}\right)^2\right) = 2\left(\frac{(v+\sqrt{4a})^2}{4}\right) = \frac{(v+\sqrt{4a})^2}{2}$$

$$\Delta < 0 \rightarrow \Delta = (m+1)^2 - 4(-m)(m+1) = (m+1)^2 + 4m(m+1)$$

$$= (m+1)(1+m+4m) = (m+1)(5m+1)$$

$$(m+1)(5m+1) < 0$$

$$m = -1 \quad m = -\frac{1}{5}$$

-1	-1/5
+	-
-	+

محدوده تغییر در این بازه مشخص می شود.

$$y = kx^2 - 4x - 4$$

$$x_{\text{نسب}} = \frac{-b}{2a} = -\frac{-4}{2k} = \frac{4}{2k} = \frac{2}{k}$$

$$y = -4x - 4$$

$$y_{\text{نسب}} = k\left(\frac{2}{k}\right)^2 - 4x \frac{2}{k} - 4 = k \times \frac{4}{k^2} - 4 \times \frac{2}{k} - 4$$

$$= \frac{4}{k} - \frac{8}{k} - 4 = -\frac{4}{k} - 4$$

$$y_{\text{نسب}} = -4x_{\text{نسب}} = -4 \times \frac{2}{k} - 4 = -\frac{8}{k} - 4$$

$$-\frac{4}{k} - 4 = -\frac{8}{k} - 4 \rightarrow \frac{4}{k} = 2 \quad k = 2$$

$$y_{\text{نسب}} = -\frac{4}{2} - 4 = -2 - 4 = -6$$