

$$\begin{cases} \alpha = \frac{\Delta \pm \sqrt{12}}{2} \\ \beta = \frac{0 - \sqrt{12}}{2} \end{cases}$$

$$\frac{(\alpha + \beta)^2}{\alpha \beta^2} = 19$$

$$\frac{f\left(\frac{0 + \sqrt{12}}{2}\right) + f\left(\frac{0 - \sqrt{12}}{2}\right)}{\omega\left(\frac{0 - \sqrt{12}}{2}\right)} = 2$$

$$\begin{cases} \alpha = 3 \\ \beta = -\frac{3}{4} \end{cases}$$

$$\alpha + \beta = 3 - \frac{3}{4} = \frac{10}{4}$$

$$|\alpha - \beta| = \frac{\sqrt{5}}{|\alpha|} = \frac{5}{3}k$$

$$\left(\frac{5}{3}k\right)^2 = \left(\frac{\sqrt{5k^2 - 20}}{1}\right)^2$$

$$\frac{25}{9}k^2 = 5k^2 - 20$$

$$\left[\frac{5k^2}{9}\right] = [5, 0] = 4$$

$$5k^2 - \frac{25}{9}k^2 = 20$$

$$\frac{25 - 25}{9}k^2 = 20$$

$$\frac{0}{9}k^2 = 20$$

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$$\alpha + \beta = 1 \rightarrow \alpha, \beta = 2$$

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

$$1 = 4 - 2\alpha\beta \rightarrow \alpha\beta = \frac{3}{2}$$

$$\rightarrow y = k(x - \alpha)(x - \beta)$$

$$\left(\frac{3}{2}\right) \rightarrow 1 = k(2 - \alpha)(2 - \beta)$$

$$\frac{3}{2} = k(2 - \alpha)(2 - \beta)$$

$$k = \frac{2}{3} = \frac{2}{3}$$

$$\alpha < \beta < \frac{9}{4}$$

$$\frac{9}{4} \rightarrow \frac{11}{4} + \frac{10}{4} + m$$

$$\frac{9}{4} + m < \frac{11}{4}$$

$$m < \frac{2}{4}$$

$$y = mx^2 - 14x + dm - 1 = 0$$

$$\left| \frac{-b}{2a} = \frac{14}{2m} = \frac{7}{m} \rightarrow y = 7 = m \left(\frac{7}{m} \right) - 14 \left(\frac{7}{m} \right) + dm - 1$$

$$\frac{7}{m} = \frac{7}{m}$$

$$-14m - 14m + dm - 1 = 0$$

$$dm - 28m - 1 = 0 \rightarrow \Delta = 28^2 - 4(-1) = 784 + 4 = 788$$

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

$$(\alpha + \beta)(\alpha - \beta) = 0$$

$$\frac{-b}{a} \times \frac{\sqrt{\Delta}}{2a} = \frac{-2\alpha - 1}{1} \times \frac{\sqrt{(\alpha + 1)^2 - (\alpha - 1)^2}}{1}$$

$$= -(\alpha + 1)\sqrt{4\alpha} = 0 \rightarrow \alpha = 0$$

$$x^2 = t$$

$$t^2 - 14t - 2 = 0$$

$$\begin{cases} t = \frac{14 \pm \sqrt{196 + 8}}{2} \\ t = \frac{14 \pm \sqrt{204}}{2} \end{cases}$$

$$t(0^2) + (-14)(0) + (-2) = 0$$

$$-2 = 0$$

$$\sqrt{196 + 8} = 14$$

$$\frac{-b}{2a} = \frac{14}{2k} = \frac{7}{k} \Rightarrow \frac{7}{k} = \frac{7}{k}$$

$$y = k \left(\frac{7}{k} \right) - 14 \left(\frac{7}{k} \right) - 1$$

$$y = \frac{7}{k} - 14 \rightarrow \frac{7}{k} - 14 = -14 \rightarrow \frac{7}{k} = 0$$

$$-14 - 14 = -28 \rightarrow k = 7$$

$$-mx^2 + m(x+1) - m - 1 = 0$$

$$-mx^2 + m(x+1) - m - 1 = 0$$

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

$$2m^2 + 4m + 1 < 0$$

$$\Delta = 4^2 - 4(1)(1) = 12$$

$$-1 < m < -\frac{1}{2}$$

m	-1	-\frac{1}{2}	0
y	+	-	+

$$x_5 = \frac{r-a}{r} = -1 \rightarrow -\frac{b}{ra} = -1 \rightarrow -\frac{b}{a} = -r = 5$$

طول راسا سهواً میانی دوتایی هم عرض است (شکل سهواً! مقبول نیست ...)

$$y - 1 = a(x+1)^2 \rightarrow y = ax^2 + 2ax + a + 1$$

$$a^2 + b^2 = 5^2 - 2p \rightarrow (-r, r - 2p \in A \rightarrow p = -\frac{1}{r} \rightarrow \frac{a+1}{a} = -\frac{1}{r} \rightarrow 2a + 2 = -a \rightarrow a = -\frac{4}{3}$$

$$\text{محض ازبدا} = a - 1 \rightarrow -\frac{4}{3} + 1 = -\frac{1}{3}$$

$$x = \frac{-\Delta \pm \sqrt{4\Delta - 4(-1)(m)}}{-2} < \frac{4}{r} \rightarrow \pm \sqrt{4\Delta + 4m} < 4$$

$$\bullet \leq 4\Delta + 4m < 14 \rightarrow -2\Delta \leq 4m < -9 \rightarrow -\frac{1\Delta}{2} \leq m < -\frac{9}{2} \rightarrow m \in \{-4, -5, -6, -7\}$$

چون عبارت زیر رادیکال
است باید منفی باشد!

$$y_{\min} = -\frac{1}{4a} \rightarrow \frac{-(144 - 4m(\Delta m - 1))}{4m} = 2m^2 - 4m - 144 = 4m$$

$$2m^2 - 8m - 144 = 0 \xrightarrow{\div 2} \Delta m^2 - 4m - 72 = 0 \xrightarrow{\text{ریشه}} m^2 - 4m - 36 = 0 \rightarrow m = \frac{4 \pm \sqrt{16 + 144}}{2} = \frac{4 \pm 10}{2}$$

مهم min در
است پس $m > 0$
است!

$$m \geq 3 \rightarrow x_5 = -\frac{b}{ra} = -\frac{12}{4} = -3$$

$$x^2 = t \rightarrow t^2 - vt - \Delta = 0 \rightarrow t = \frac{v \pm \sqrt{v^2 + 4\Delta}}{2} \xrightarrow{x^2} x = \frac{v + \sqrt{v^2 + 4\Delta}}{2}$$

$$x = \pm \sqrt{\frac{v + \sqrt{v^2 + 4\Delta}}{2}} \rightarrow s = 0, p = -\left(\frac{v + \sqrt{v^2 + 4\Delta}}{2}\right)$$

$$2p^2 - \underbrace{4sp} + \underbrace{2s} = 2p^2 = 2\left(\frac{v + \sqrt{v^2 + 4\Delta}}{2}\right)^2 = \frac{1}{2}(v^2 + 4\Delta + 4v\sqrt{v^2 + 4\Delta}) = 29 + v\sqrt{49}$$

$$\text{میانگین} = x_5 = -\frac{b}{ra} = \frac{f}{rk} = \frac{r}{k}$$

$$y_5 = k\left(\frac{r}{k}\right)^2 - f\left(\frac{r}{k}\right) - 4 = \frac{f}{k} - \frac{r}{k} - 4 = -\frac{f}{k} - 4$$

$$-\frac{f}{k} - 4 = -f\left(\frac{r}{k}\right) - 4 \rightarrow \frac{f}{k} = r \rightarrow k = 2$$

$$\text{میانگین} = -\frac{f}{k} - 4 = -2 - 4 = -6$$