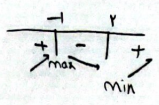




$$8x^2 - 7x - 12 = 0 \quad \Delta = 49 - 4 \cdot 8 \cdot (-12) = 49 + 384 = 433$$

$$x = \frac{7 \pm \sqrt{433}}{16}$$



$$7x^2 - 7x - 12 = -9x - 1$$

$$7x^2 - 2x - 11 = 0 \quad \Delta = 4 - 4 \cdot 7 \cdot (-11) = 4 + 308 = 312$$

$$x = \frac{2 \pm \sqrt{312}}{14}$$

6

قانون  $\rightarrow f(x) = kx^2 + r(k+1)x$   $\rightarrow 9kx + r(k+1) = 0$

حج مقادیر

$$f(x) = \frac{-k-1}{2k} \left( \frac{-k^2-k}{2k} + \frac{k+1}{2k} \right)$$

$$\rightarrow 0 \rightarrow \frac{r(k+1)}{2k} > 0$$

$$x = \frac{-k-1}{2k} = \frac{-k-1}{2k} < 0 \rightarrow -1/2k$$

حج مقادیر  $k$

7

$$kx^2 + rax + b$$

$$r - ra + b = 0 \quad \begin{cases} ra - b = r \\ a - b = -r \end{cases}$$

$$-1 + a - b - 1 = -r \quad \begin{cases} a - b = r \\ a - b = -r \end{cases}$$

$a = 0$     $b = r$

$$\frac{a}{b} = \frac{r}{r} = 1$$

$$\frac{1}{2}k = -\frac{b}{2a} \rightarrow a = \frac{a}{r} \rightarrow \frac{a}{r} = -1 \rightarrow a = r$$

$$\frac{a}{b} = \frac{r}{r} = 1$$

$$-r = -1 + r - b - 1 \rightarrow b = 2$$

8

$$kx^2 + rax + b$$

$C = F$   $\rightarrow$   $\frac{a}{b} = \frac{r}{r} = 1$

$$f(x) = kx^2 + rax + b \rightarrow \text{حج مقادیر}$$

$b = 0$

$$x(k + ra) = 0 \rightarrow -ra = x \rightarrow y = 0$$

حج مقادیر  $a$

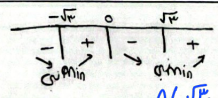
$$\frac{ka^2}{2} + rfa + f = 0$$

$$\frac{a^2 + 2ra + 2f}{2} = 0 \quad a^2 = \frac{r^2}{a} \rightarrow a = \frac{r}{\sqrt{a}}$$

$x = \frac{-r}{\sqrt{a}}$

9

$$f(x) = kx^2 - rx = kx(x - r)$$



$$A(-\sqrt{r}, -r), B(\sqrt{r}, -r) \rightarrow MAB = 0$$

$\frac{1}{2}$

$$kx^2 - rx = 0 \quad x^2 = 1 \rightarrow x = \pm 1 \quad | \quad D \begin{vmatrix} 1 & -r \\ 0 & -1 \end{vmatrix} \quad y = 0$$

$$\frac{m - m'}{1 + mm'} = \frac{k}{1} \quad \text{حج مقادیر}$$

حج مقادیر  $CD$  و  $AB$  در  $\frac{1}{2}$

10

سؤال 1!

$$f(x) = \cos^{\mu}(kx) + ax^{\nu} + b$$

$$\lim_{x \rightarrow 0^+} \frac{f(x)}{x} = 0 \rightarrow \lim_{x \rightarrow 0^+} \frac{\cos^{\mu}(kx) + ax^{\nu} + b}{x} = 0 \rightarrow \lim_{x \rightarrow 0^+} \frac{1+b}{x} = 0 \rightarrow b = -1$$

$$\lim_{x \rightarrow 0^-} \frac{f(x)}{x} = \nu \rightarrow \lim_{x \rightarrow 0^-} \frac{-\nu \sin(kx) \cos^{\nu-1}(kx) + \nu ax^{\nu-1}}{x} = \nu \xrightarrow{\text{Simplification}} \lim_{x \rightarrow 0^-} \frac{-\nu \times kx + \nu ax}{x} = \nu$$

$$\rightarrow \lim_{x \rightarrow 0^-} \frac{(\nu a - \nu k)x}{x} = \nu \rightarrow \nu a - \nu k = \nu \rightarrow a = k \quad a+b = \nu$$

السؤال 2!

$$f(1) = \nu \rightarrow (1)^{\mu} + a(1) + b(1) + c = \nu \rightarrow c = \nu$$

$$f'(u) = \mu u^{\mu-1} + \nu a u + b \rightarrow f'(1) = 0 \rightarrow f'(1) = \mu(1)^{\mu-1} + \nu a(1) + b = 0 \rightarrow b = 0$$

$$f(u) = u^{\mu} + a u^{\nu} + \nu \rightarrow f'(u) = \mu u^{\mu-1} + \nu a u = 0 \rightarrow u(\mu u^{\mu-2} + \nu a) = 0 \rightarrow \begin{cases} u = 0 \\ a = -\frac{\mu}{\nu} \end{cases}$$

u	0	$-\frac{\nu a}{\mu}$	
y'	+	-	+
y	↗	↘	↗
		min	

$$\rightarrow f(-\frac{\nu a}{\mu}) = 0 \rightarrow (-\frac{\nu a}{\mu})^{\mu} + a(-\frac{\nu a}{\mu})^{\nu} + \nu = 0$$

$$\rightarrow \frac{-\nu a^{\mu}}{\mu} + \frac{\nu a^{\mu}}{\mu} + \nu = 0 \rightarrow a^{\mu} = -\nu \rightarrow a = -\nu^{\frac{1}{\mu}}$$

$$x = -\frac{\nu a}{\mu} \rightarrow x_{min} = \frac{-\nu(-\nu^{\frac{1}{\mu}})}{\mu} = \nu$$