

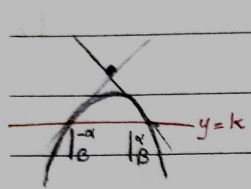
**ماتریا**

۱- در این مسئله، فرض می‌کنیم  $f(x) = a + b \cos(rx)$  و  $f'(x) = -r \sin(rx)$  داریم.  $f(0) = a + b = 1$  و  $f'(0) = 0$  داریم.

$f'(0) = 0 \Rightarrow f'(x) = -r \sin(rx) = 0 \Rightarrow \sin(rx) = 0 \Rightarrow rx = 0 \Rightarrow x = 0$  (Hop)

Hop  $\rightarrow (a \cos(rx) - r \sin(rx) \cdot x) + (-r \cos(rx) \cdot x) + ra = 1$

$x=0 \rightarrow -1r + ra = 1 \Rightarrow a = \frac{1}{r} \Rightarrow a + b = 1$  (۲)



$y' = rx$   
 $\left. \begin{aligned} \text{در } x = \frac{\pi}{2r}, y' = rx = \frac{\pi}{2} \\ \text{در } x = \frac{\pi}{r}, y' = rx = \pi \end{aligned} \right\}$

$\rightarrow rx - \frac{\pi}{2} = -1 \rightarrow r = \frac{\pi}{2} + 1$   
 $\rightarrow \beta = \frac{\pi}{r}$  (۳)

$a = \frac{1}{r} = \frac{1}{\frac{\pi}{2} + 1} = \frac{2}{\pi + 2}$

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$y' = \frac{1-a}{(ax+1)^2} = r \Rightarrow \frac{1-a}{(ax+1)^2} = r \Rightarrow (ax+1)^2 = \frac{1-a}{r}$

$\rightarrow ax+1 = \sqrt{\frac{1-a}{r}} \Rightarrow ax = \sqrt{\frac{1-a}{r}} - 1 \Rightarrow x = \frac{\sqrt{\frac{1-a}{r}} - 1}{a}$

$\rightarrow x = \frac{\sqrt{\frac{1-a}{r}} - 1}{a} = \frac{\sqrt{\frac{1-a}{r}} - 1}{\frac{1-a}{r}} = \frac{r}{1-a} (\sqrt{\frac{1-a}{r}} - 1)$

$\rightarrow y = \frac{1-a}{(ax+1)^2} = r \Rightarrow y = \frac{1-a}{r}$  (۳)

$f'(x) = -r \sin(rx) = \frac{1}{r} \cos(rx) \Rightarrow \sin(rx) = \frac{1}{r^2} \Rightarrow rx = \frac{\pi}{2} \Rightarrow x = \frac{\pi}{2r}$

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$4m^2 - 4m - 15 = 9 \Rightarrow 4m^2 - 4m - 24 = 0 \Rightarrow m^2 - m - 6 = 0 \Rightarrow (m-3)(m+2) = 0$

$m = 3$  or  $m = -2$

$y'' = 4kx + 2k + r = 0 \Rightarrow 4kx + 2k + r = 0 \Rightarrow x = -\frac{2k+r}{4k}$

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$y = mx + h$

$\rightarrow m + h = a - b \cdot r$

$\left. \begin{aligned} h - m &= -r \\ a - b &= -r \\ -r + b &= m \Rightarrow b = m + r \\ a &= a - m \end{aligned} \right\} \begin{aligned} a &= \frac{2m}{\sqrt{-m}} \\ b &= \frac{r-m}{\sqrt{-m}} \end{aligned}$

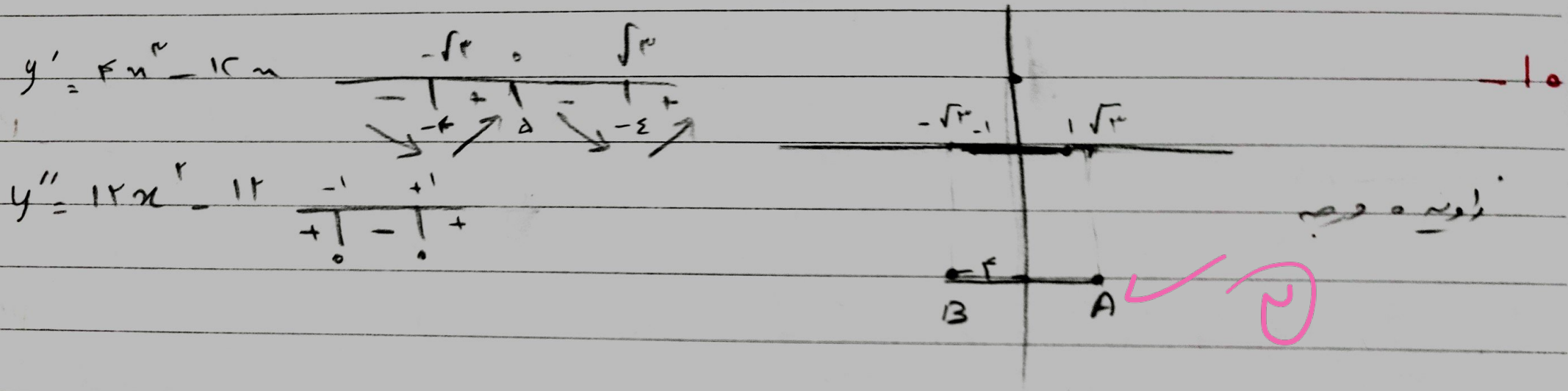
$\rightarrow a = \frac{2m}{\sqrt{-m}}$  and  $b = \frac{r-m}{\sqrt{-m}}$

9.  $m'' + am' + bm + C = 0$ ,  $r^2m' + ram + b = 0$  معمولاً  $m = 0$  یا  $m = -\frac{ra}{r}$

$f'(0) = 0 \rightarrow b = 0$ ,  $f(0) = F \rightarrow C = F \rightarrow m'' + am' + F = 0$ ,  $r^2m' + ram = 0$

$\Rightarrow \frac{-na''}{r^2} + a(\frac{ra'}{a}) + F = 0 \Rightarrow \frac{a''}{r^2} = -1 \rightarrow a = -r \rightarrow m = r$

D



$$m = \frac{4 - (-12)}{2 - (-10)} = \frac{16}{12} = 4 \rightarrow y = 4x - 9$$

12

$$\frac{a}{2x-1} = 4x-9 \rightarrow 12x^2 - 12x + 9 - a = 0 \xrightarrow{\Delta=0} \cancel{12x^2} - \cancel{12x}(9-a) = 0 \rightarrow 12-9+a=0$$

$\hookrightarrow a = -3$

$$f(\Delta) = \frac{-12}{2(0)-1} = \frac{-12}{-1} = 12$$

$$\text{نقطه } x = -\frac{b}{2a} = -\frac{a}{12} \rightarrow x = -\frac{a}{12} \rightarrow \frac{-a}{12} = -1 \rightarrow a = 12$$

12

$$f(-1) = -2 \rightarrow -1 + 12 - b - 1 = -2 \rightarrow b = 12$$

$$\left. \begin{array}{l} \\ \end{array} \right\} \frac{a}{b} = \frac{12}{12}$$