

نتا امیرا

$$\lim_{x \rightarrow 0^+} \frac{\cos^p(x) + ax^r + b}{x} \xrightarrow{b \rightarrow \text{HOP}} \frac{p(x)(-\sin x) + rax}{1}$$

$x \rightarrow 0^+ \Rightarrow 0 \checkmark$

1/1

$$\lim_{x \rightarrow 0^-} \frac{f'(x)}{x} \xrightarrow{\text{HOP}} \frac{-4\sin x + ra}{1} \xrightarrow{\text{HOP}} \frac{-1r \cos x + ra}{1} \xrightarrow{x \rightarrow 0} r + ra = r$$

$a = r$

$$a + b = r + 0 = r$$

سوال ۲

$$x^2 - 1 = d \rightarrow x = \pm \sqrt{1+d} \quad f'(x) = 2x$$

سوال ۲

$$2\sqrt{1+d} \times (-2\sqrt{1+d}) = -1 \rightarrow 4(1+d) = 1 \rightarrow d = \frac{-3}{4} \rightarrow x = \frac{1}{2}, -\frac{1}{2}$$

$$\left(\frac{1}{2}\right)^2 - 1 = \frac{-3}{4} \quad \left(-\frac{1}{2}\right)^2 - 1 = \frac{-3}{4} \quad \text{ضرب} \quad \frac{-3}{4} + \left(\frac{-3}{4}\right) = \frac{-3}{2}$$

$$m = \frac{4 - (-12)}{2/0 - (-2/0)} = 7 \rightarrow 7x + b = y \quad (7, 0) \rightarrow b = -9$$

سوال ۳

$$7x - 9 = \frac{a}{x^2 - 1} \quad f'(x) = \frac{-2a}{(x^2 - 1)^2} = 4 \rightarrow a = -2(x^2 - 1)^2$$

$$\rightarrow \frac{-2(x^2 - 1)^2}{(x^2 - 1)^2} \rightarrow -4x^2 + 4 = 4x^2 - 4 \rightarrow x = 1 \rightarrow \frac{-2a}{(1 - 1)^2} = 4 \rightarrow a = -2$$

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

$$y' = \frac{1 - a^2}{(a^2 + 1)^2} \quad n=1 \rightarrow \frac{(1-a)(1+a)}{(a+1)^2} = \frac{1-a}{a+1} = 2 \rightarrow a = -\frac{1}{2}$$

سوال ۴

$$n=1 \rightarrow \frac{1 - 1/4}{-1/4 + 1} = 1 \rightarrow 1 = 2 + b \rightarrow b = -1 \quad a - b = -\frac{1}{2} - (-1) = \frac{1}{2}$$

$$f(x) = g(x) \rightarrow \sin 7x + \frac{1}{2} \cos x = \frac{2}{2} \sin x$$

سوال ۵

$$\rightarrow \frac{1}{2} \cos x = \frac{1}{2} \sin x \quad [0, \pi] \rightarrow x = \frac{\pi}{4}$$

$$f'(x) = \cos x - \frac{1}{2} \sin x \Rightarrow \frac{\sqrt{2}}{2} - \frac{1}{2} \times \frac{\sqrt{2}}{2} = \frac{\sqrt{2}}{4}$$

$$\frac{\sqrt{2}}{4} \times \frac{\pi}{4} + b = \frac{\sqrt{2}}{4} \rightarrow b = \frac{\sqrt{2}}{4} - \frac{\sqrt{2}\pi}{16} \rightarrow y = \frac{\sqrt{2}}{4} x + \frac{\sqrt{2}}{4} - \frac{\sqrt{2}\pi}{16}$$

$$\rightarrow x = \frac{\sqrt{2}/4 - \sqrt{2}/16 \times \pi}{\sqrt{2}/4} = 1 - \frac{\pi}{4}$$

$$f'(x) = 4x^2 - 4x - 12 = 4(x-2)(x+1) = 0$$

سوال ۶

$$f(x) = 4x^2 - 4x - 12 \quad f(2) = 16 - 8 - 12 = -4 \quad f(-1) = -4 - 4 + 12 - 12 = -8$$

$$m = \frac{-19 - (-8)}{2 - (-1)} = -9 \quad 4m^2 - 4m - 12 = 9 \rightarrow 4m^2 - 4m - 21 = 0$$

$$\rightarrow 4m^2 - 4m - 21 = 0 \rightarrow \Delta = 4 + 252 = 256 > 0 \rightarrow \text{دو جواب دارد}$$

$$f'(x) = 2kx^2 + 2(k+1)x \quad f'(x) = 2kx + 2k + 2 = 0$$

سوال ۷

$$\rightarrow x = \frac{-k-1}{k} \rightarrow \frac{-k-1}{k} < 0 \rightarrow k+1 > 0 \rightarrow k > -1$$

به ازای هر مقدار صحیح و منفی بزرگتر از -1 و کوچکتر از 0 این رابطه برقرار است

Subject.

Date.

$$f(-1) = -\epsilon = -1 + a - b \rightarrow -\epsilon = a - b$$

3 وال

$$f'(x) = 2ax + \epsilon a + b$$

$$f(1) = \epsilon \rightarrow c = \epsilon \quad f'(x) = 2ax + \epsilon a + b \quad f'(1) = 0$$

4 وال

$$\rightarrow b = 0 \quad f'(x) = 0 \rightarrow x(2a + \epsilon a) = 0 \rightarrow x = 0, x = -\frac{\epsilon a}{2}$$

$$f\left(-\frac{\epsilon a}{2}\right) = -\frac{1}{2} \epsilon a^2 + \frac{\epsilon}{2} a^2 + \epsilon = 0 \rightarrow \frac{\epsilon}{2} a^2 = -\epsilon \rightarrow a = -2$$

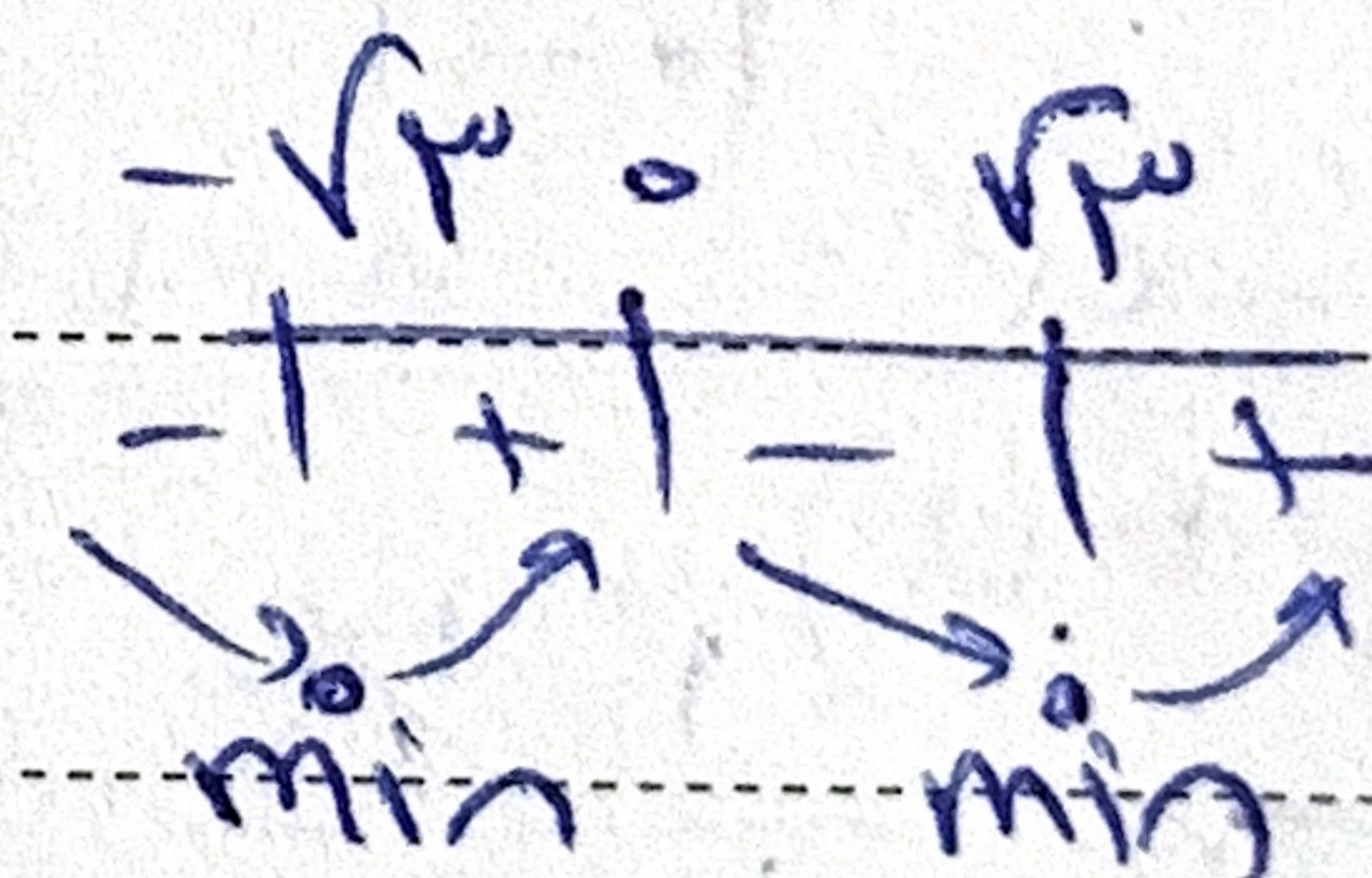
$$x = -\frac{\epsilon a}{2} = -\frac{\epsilon(-2)}{2} = \epsilon = \text{min}$$

$$f(x) = x^2 - 4x + 4 \quad f'(x) = 2x - 4$$

5 وال

$$f'(x) = 0 \rightarrow 2x - 4 = 0 \rightarrow x = 2, \pm\sqrt{2}$$

$$f''(x) = 2 > 0 \rightarrow x = 2 \text{ is a local min}$$



$$f(\sqrt{2}) = 2 - 4\sqrt{2} + 4 = -2\sqrt{2} \quad f(-\sqrt{2}) = 2 + 4\sqrt{2} + 4 = 6 + 4\sqrt{2}$$

A(2 - 2) B(-2 - 2) C(1, 0) D(-1, 0)

$y = -2\sqrt{2} \in AB$

$y = 0 \in CD$