

# بسط دراز هم

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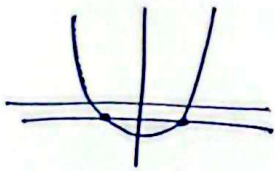
$$f(x) = \cos^2(x) + ax^2 + b \longrightarrow f'(x) = -2\cos(x)\sin(x) + 2ax \quad (1)$$

$$f''(x) = -12\cos^2(x) + 2a \quad f'(0) = 0 \quad f(0) = 1 + b = 0 \quad f''(0) = -12 + 2a = 2$$

$$b = -1 \quad a + b = 9 \\ a = +10$$

$$\lim_{x \rightarrow 0^+} \frac{f(x)}{x} = f'(x) = 0 \quad \lim_{x \rightarrow 0^-} \frac{f'(x)}{x} = f''(0) = 2$$

$$f(x) = 0$$



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

$$f\left(\frac{1}{\sqrt{\epsilon}}\right) = \frac{1}{\epsilon}$$

$$f\left(-\frac{1}{\sqrt{\epsilon}}\right) = \frac{1}{\epsilon}$$

$$x = \frac{1}{\sqrt{\epsilon}} = \frac{1}{\sqrt{\epsilon}}$$

(2)

$$4x_0 - 9 = \frac{a}{x_0 - 1}$$

$$f'(x_0) = \frac{-2a}{(x_0 - 1)^2} = 4 \longrightarrow a = -2(x_0 - 1)^2$$

$$4x_0 - 9$$

$$n = \frac{4x_0 - 9}{x_0 - 1} = 4$$

$$3(x_0 - 3) = \frac{-2(x_0 - 1)^2}{x_0 - 1} = x_0 - 1 \\ a = -2$$

(3)

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

$$f(1) = 2 + b = \frac{a+1}{a+1} = 1 \longrightarrow b = -1$$

$$f'(1) = 2 \quad \frac{1-a^2}{(1+a)^2} = \frac{1-a}{1+a} \Rightarrow a = -\frac{1}{2}$$

$$\Rightarrow a - b = \frac{1}{2}$$

(4)

$$g(x) = f(x)$$

(5)

$$\sin(x) \frac{1}{\sqrt{x}} \cos(x) = \frac{\sqrt{x}}{x} \sin(x) \Rightarrow \cos(x) = \sin(x) \Rightarrow x = \frac{\pi}{4}$$

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

$$g = \frac{\sqrt{x}}{x} x + b$$

$$f\left(\frac{\pi}{4}\right) = \frac{\sqrt{\pi}}{\pi}$$

$$\frac{\sqrt{\pi}}{\pi} \left(\frac{\pi}{4}\right) + b = \frac{\sqrt{\pi}}{\pi} \longrightarrow b = \frac{\sqrt{\pi}}{\pi} \left(\pi - \frac{\pi}{4}\right)$$

$$\frac{\sqrt{\pi}}{\pi} x = \frac{\sqrt{\pi}}{\pi} \left(\pi - \frac{\pi}{4}\right) = 0$$

$$x = \frac{\pi}{4} - \pi$$

$$f'(x) = 0 \quad m = \frac{\Delta + 19}{-1 - 2} = -9$$

$$f(x) = 4x^2 - 4x - 12$$

$$f'(x) = 4x^2 - 4x - 12 = -9 \rightarrow 4x^2 - 4x - 12 = 0 \quad \Delta > 0$$

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

$$x < 0 \quad f''(x) = 0 \quad 4kx = -2(k+1) \quad x = \frac{-(k+1)}{2k} < 0$$

$$\frac{1}{-1+1} \quad 2^2(kx+k+1) > 0 \quad \frac{(k+1)^2}{(2k)^2} \left( \frac{-(k+1)}{2} + (k+1) \right) > 0$$

$$\frac{(k+1)^2}{(2k)^2} > 0 \Rightarrow \frac{-1 \cdot 0}{-1+1}$$

کمیسیون استانی مصحح  
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$$A(-1 - f) \quad 4a + 2c = 0 \quad -4 = -2a \quad f(-1) = -f$$

$$f'(-1) = 0$$

$$a = 2$$

$$-1 + 2 - b - 1 = -f$$

$$\frac{a}{b} = \frac{2}{8}$$

$$b = 8$$

$$f(0) = f \rightarrow c = f$$

$$f'(0) = 0 \rightarrow 2a^2 + 2ca + b \rightarrow b = 0 \quad f'(x) = 2ax^2 + 2cax = 0$$

$$f'\left(-\frac{2c}{a}\right) = 0$$

$$2 \cdot \left( \frac{2c}{a} \right) + 2ca \cdot \left( \frac{2c}{a} \right) = 0$$

$$\frac{-(2c^2)}{2a} + a \left( \frac{4c^2}{a} \right) + f = 0 \quad -5 - 5 = \frac{-10a^2}{2a} + \frac{4c^2}{2a} \rightarrow -f = \frac{4c^2}{2a}$$

$$a = -2c$$

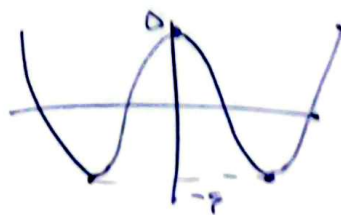
$$x_0 = 2$$

$$f(x) = 4x^2 - 12x$$

$$f''(x) = 8x - 12$$

$$A(2 - f) \quad C(1 - 0)$$

$$B(-2 - f) \quad D(-1 - 0)$$



	$-2$	$0$	$2$	
$f(x)$	$-$	$0$	$-$	$0$
$f'(x)$	$\downarrow$	$\uparrow$	$\downarrow$	$\uparrow$
	$-f$	$0$	$-f$	$0$

(D)  $f(2) = 4$