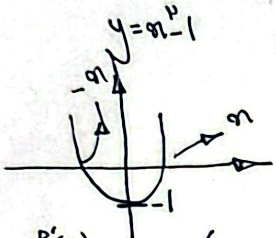
-۱ $f'(x) = 3\cos^2 x\, a - 2\sin 2x + 2ax$

-۲ $y = x^2 - 1 \Rightarrow 2(x^2-1) = 2x^2 - 2 = \frac{1}{2} - 2 = \frac{1}{2} - 2 = -\frac{3}{2}$



$y' = 2x \Rightarrow 2xa - 2x = -1 \Rightarrow x^2 = \frac{1}{4} \Rightarrow x = \pm\frac{1}{2}$

-۳ $f'(x) = -\frac{2a}{(2x-1)^2}$ $\quad -\frac{2a}{14}a^2 5 + y = 4 \Rightarrow 4 + \frac{a}{8}a^2 5 = y \Rightarrow 18 = \ldots \frac{a}{8} = \frac{a}{4} = -\frac{45a}{8}$

$-\frac{2a}{4}a^2 5 + y = -12 \quad -12 - \frac{a}{4} = y$

$\Rightarrow a = \frac{8a}{-45} = -32 \qquad \frac{}{4-2} \Rightarrow f'(5) = -\frac{32}{10-1} = -\frac{32}{9}$

-۴ $\frac{1+a}{a+1} = 2 + b \Rightarrow b = -1$

$\frac{ax+1 - a(x+a)}{(ax+1)^2} = 2 \Rightarrow \frac{a+1-a-a^2}{(a+1)^2} = 2 \Rightarrow 1 - a^2 = 2a^2 + 2 + 4a \Rightarrow 3a^2 + 4a + 1 = 0 \Rightarrow a^2 + 4a + 3 = 0 \Rightarrow (a+1)(a+3) = 0$

$\Rightarrow a = -1, -3 \Rightarrow a - b = -1 + 1 = 0$

$-3 + 1 = -2$

-۵ $\frac{3}{2}\sin x = \sin x + \frac{1}{2}\cos x$

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

$\Rightarrow \frac{3}{2}\sin\frac{\pi}{4} = \frac{3}{2} \times \frac{\sqrt{2}}{2} = \frac{3\sqrt{2}}{4} \Rightarrow \frac{\sqrt{2}}{4} \times \frac{\pi}{4} + y = \frac{3\sqrt{2}}{4} \Rightarrow y = \frac{3\sqrt{2}}{4} - \frac{\sqrt{2}}{4} \times \frac{\pi}{4}$

-۶ $f'(x) = 6x^2 - 6x = 6x(x-1) \Rightarrow (0,1), (1,-12) \Rightarrow \frac{1+12}{-1} = -13 \Rightarrow -13x + 1 \Rightarrow 6x^2 - 6x = -13 \Rightarrow 6x^2 - 6x + 13 = 0 \Rightarrow$ ندارد.

$\quad\; 0 \quad 1$

$f(1) = 2 - 3 - 12 + 1 = 3 - 15 = -12$

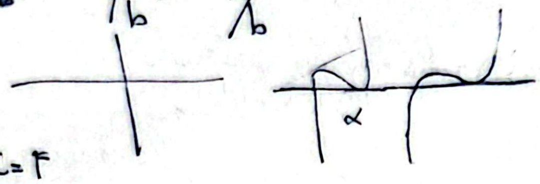
-۷

$y' = 3x^2 + 2ax + b \Rightarrow$ ($x=-1$) $3 - 2a + b \Rightarrow (3 - 2a + b)(x+1) + y = -4 \Rightarrow (3 - 2(-2+b) + b)(x+1) + y = 4a - 2b$

$x=-1 \Rightarrow y = -1 + a - b - 1 = -4 \Rightarrow a - b = -2 \Rightarrow a = -2 + b$

$\Rightarrow -7 + b + y = 4a - 2b \Rightarrow -8 + 4b - 2b = -7b + y \Rightarrow b + y = 3 \Rightarrow y = 3 - b$

$a/b = -2 + b/b$



$2x^2 + 2ax + b = 0$

$\Rightarrow 3x^2 + (-4 + 2b)x + b = 0 \Rightarrow 3x^2 - 4x + 2bx + b = 0$

$x^3 + (b-2)x^2 + bx - 1 = -4 \Rightarrow x^3 + bx^2 - 2x^2 + bx = -3$

$f(0) = c = 4$

$f'(0) = 3x^2 + 2ax + b = 0 \Rightarrow b = 0$

$\Rightarrow -8a^3/27 + 4a^3/9 + 4 = 0 \Rightarrow -8a^3 + 12a^3 + 4 \cdot 27 = 0$

$3x^2 + 2ax + b = x(3x + 2a) = 0 \Rightarrow x = 0,\ x = -2a/3$

$\Rightarrow 4a^3 + 4 \cdot 27 = 0 \Rightarrow 4(a^3 + 27) = 0 \Rightarrow a = -3 \Rightarrow \min = -2a/3 = 2$

$f'(x) = 4x^3 - 12x = 4x(x^2 - 3)$ → 0, $\pm\sqrt{3}$

$f(\sqrt{3}) = f(-\sqrt{3})$

$f''(x) = 12x^2 - 12 = 12(x^2 - 1)$ → $x = \pm 1$

$f(1) = f(-1)$

$f(x) = (x^2 - 1)(x^2 - a)$ → ± 1, $\pm\sqrt{a}$

x		$-\sqrt{3}$		0		$+\sqrt{3}$	
$f'(x)$	$-$		$+$		$-$		$+$
$f(x)$	↘		↗		↘		↗

$9 - 18 + a = -4$; a ; -4

$\Rightarrow$ $a = 5$