آدرینا حسینی تکلیف ش ۲۳ کلاس دوازدهم تجربی A

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$f(x) = |4x-3|\sqrt{ax}$

$\xrightarrow{x=\frac{3}{4}^+} f'_+(x) = \left((4x-3)\sqrt{ax}\right)' = 4\sqrt{ax} + \dfrac{(4x-3)\times a}{2\sqrt{ax}} = 4\times\sqrt{\dfrac{a\times 3}{4}}$

$\xrightarrow{x=\frac{3}{4}^-} f'_-(x) = \left((3-4x)\times\sqrt{ax}\right)' = -4\sqrt{ax} + \dfrac{(3-4x)\times a}{2\sqrt{ax}} = -4\sqrt{\dfrac{a\times 3}{4}}$

اختلاف شیب مماس چپ و راست: $= 8\sqrt{\dfrac{3a}{4}} = \dfrac{8\times\sqrt{3a}}{2} = 4\sqrt{3a} = 2\sqrt{6} \rightarrow 2\sqrt{12a} = 2\sqrt{6} \rightarrow \boxed{a=\frac{1}{2}}$

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$y + ax = 2 \longrightarrow y = -ax+2 \longrightarrow f'(x) = -a$

$f'(4) + f(4) = -1 \longrightarrow -a + -4a + 2 = -5a + 2 = -1 \longrightarrow -5a = -3 \rightarrow a = \frac{3}{5}$

$f'(4) = -a = -\frac{3}{5} = -0.6$

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$7y - x = 5$

$\dfrac{ax-1}{3x+1} = \longrightarrow \dfrac{x+5}{7} = \dfrac{ax-1}{3x+1} \rightarrow 7ax - 7 = 3x^2 + 16x + 5$

$\longrightarrow 3x^2 + (16-7a)x + 12 = 0 \longrightarrow \Delta = 0 \longrightarrow (16-7a)^2 - 4(3)(12) \longrightarrow (16-7a)^2 = (12)^2$

$16 - 7a = 12 \longrightarrow a = \frac{4}{7}$ ✗

$16 - 7a = -12 \longrightarrow a = 4$ ✓

$a = 4 \longrightarrow 3x^2 - 12x + 12 \longrightarrow 3(x-2)^2 = 0 \longrightarrow x = 2$

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$f(x) = x^3 + ax - b \longrightarrow f'(x) = 3x^2 + a \xrightarrow{x=2} 12 + a = 0 \longrightarrow a = -12$

$f(2) = 0 \longrightarrow 8 - 12\times 2 - b = 0 \longrightarrow b = -16$

$b - a = -16 + 12 = -4$

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$f(x) = \dfrac{\sqrt{x}+1}{\sqrt{x}-1} \longrightarrow f'(4) = \dfrac{\frac{1}{2\sqrt{x}}(\sqrt{x}-1) - (\sqrt{x}+1)\frac{1}{2\sqrt{x}}}{(\sqrt{x}-1)^2} = \dfrac{\frac{\sqrt{4}-1}{2\sqrt{4}} - \frac{\sqrt{4}+1}{2\sqrt{4}}}{(\sqrt{4}-1)^2}$

$\dfrac{\frac{-2}{2\sqrt{4}}}{(\sqrt{4}-1)^2} = \dfrac{-1}{\sqrt{4}(\sqrt{4}-1)^2}$

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آهنگ متوسط $= \dfrac{\Delta y}{\Delta x} = \dfrac{(1+1)^3(-a+1) - 1}{-1-0} = \dfrac{-8a+8-1}{-1} = \dfrac{-8a+7}{-1} = 8a - 7 = -11 \rightarrow 8a = -4 \rightarrow a = -\frac{1}{2}$

آهنگ لحظه‌ای y' $x=1$ $= 3(2x)(x^2+1)^2(-\frac{1}{2}x+1) + (x^2+1)^3(-\frac{1}{2}) = 6\times 4\times\frac{1}{2} - 4 = 8$

$\boxed{۱۰}$

آهنگ متوسط ۱ $= \dfrac{\Delta y}{\Delta x} = \dfrac{\cancel{\sin\frac{\pi}{4}\cos\frac{\pi}{2}} - \underset{1}{\sin\frac{\pi}{2}}\,\underset{-1}{\cos\pi}}{\frac{\pi}{4}-\frac{\pi}{2}} = \dfrac{1}{-\frac{\pi}{4}} = \dfrac{-4}{\pi}$

$\hookrightarrow \sin x\cos 2x$

$\longrightarrow$ $\boxed{\text{۱- برابر هست}}$

آهنگ متوسط ۲ $= \dfrac{\Delta y}{\Delta x} = \dfrac{\cancel{\sin^4\frac{\pi}{4} - \cos^4\frac{\pi}{4}} - \overset{1}{\sin^4\frac{\pi}{2}} + \cancel{\cos^4\frac{\pi}{2}}}{\frac{\pi}{4}-\frac{\pi}{2}} = \dfrac{-1}{-\frac{\pi}{4}} = \dfrac{4}{\pi}$

$\hookrightarrow \sin^4 x - \cos^4 x$

$\left(\dfrac{\sqrt{2}}{2}\right)^4 = \dfrac{4}{16} = \dfrac{1}{4}$