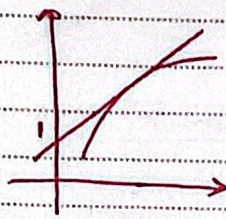


فاصله جانی

بسم الله الرحمن الرحیم

۸ | 8 Mar 2026
۱۴۴۷ رمضان

۱) $(x, y) \rightarrow f(x) = ?$



نسبت شیب در نقطه (x, y)
 $\frac{a+b}{x} = \frac{a}{x} + \frac{b}{x}$
 $\frac{a+b}{x} = \frac{a}{x} + \frac{b}{x}$

$f(x) = a \rightarrow \frac{a+b}{x} = \frac{a}{x} + \frac{b}{x} \rightarrow \frac{a}{x} = \frac{a}{x}$

$\rightarrow a = \frac{a}{x} = f'(x)$

۲) $f(x) = \sqrt{ax-1} \rightarrow$ شیب $(-1, 1)$ و $(x, y) \rightarrow f(x) = ?$

نسبت شیب در نقطه (x, y) : $a+b = y$ $\begin{cases} -a+b=1 \\ a+b=y \end{cases} \rightarrow \frac{-a+b}{a+b} = \frac{1}{y} \rightarrow \frac{-a}{a+b} + \frac{b}{a+b} = \frac{1}{y}$

\rightarrow شیب $= \frac{1}{y} \rightarrow \frac{1}{y} = \frac{1}{\sqrt{ax-1}} \rightarrow$ شیب در نقطه (x, y) \rightarrow شیب در نقطه $(-1, 1)$ \rightarrow شیب در نقطه (x, y) \rightarrow شیب در نقطه $(-1, 1)$

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

$\rightarrow 9ax - 9 = ax^2 + 1 \rightarrow ax^2 - 9ax + 10 = 0$

$(1-9a)^2 - 4(1)(10) = 0 \rightarrow (1-9a)^2 = 40$

$1-9a = 10 \rightarrow 9a = -9 \rightarrow a = -1$
 $\frac{1}{\sqrt{-1-1}} = \frac{1}{\sqrt{-2}} = \frac{1}{i\sqrt{2}} = -\frac{i}{\sqrt{2}}$

$\rightarrow a = -1 \rightarrow \sqrt{-1-1} = f(x) = \sqrt{-1-1} = \sqrt{-2} = \sqrt{2}$

۳) $\frac{x^2+mx+1}{x+n}$, $ny - mx = n \rightarrow m+n = ?$

نسبت شیب در نقطه (x, y) \rightarrow شیب در نقطه (x, y) \rightarrow شیب در نقطه (x, y)

$\frac{1+m}{x} = \frac{x^2+mx+1}{x^2+n} \rightarrow \frac{1+m}{x} = \frac{x^2+mx+1}{x^2+n} \rightarrow \frac{1+m}{x} = \frac{x^2+mx+1}{x^2+n}$

$\rightarrow f'(x) = \frac{m}{x} \leftarrow$ شیب در نقطه (x, y) \rightarrow شیب در نقطه (x, y)

شیب

$f(x+m) - (x+m)$

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$f'(1) = \frac{(x+m)(x+r) - (1)(x+m+1)}{(x+m)^2} = \frac{r}{r}$

$\frac{r(x+m)}{r^2} = \frac{1}{r} \rightarrow r+m < r \rightarrow \boxed{m < 0}$

$m - n = 1 \rightarrow \boxed{n < 1} \rightarrow m+n = \boxed{0}$

3) $rg'(\frac{dR}{r}) - f'(\frac{dR}{r}) = ?$ $g(x) = \frac{r}{r+\sin x}$ $f(x) = \frac{r - \sin x}{r - \sin^2 x}$

$(rg - f)'(\frac{dR}{r}) = ?$

$rg - f = \frac{r}{r+\sin x} - \frac{r + r \sin x + \sin^2 x - \sin^2 x}{r + \sin x} = \frac{-\sin^2 x}{r + \sin x}$

$* f = \frac{r - \sin^2 x}{r - \sin^2 x} = \frac{(r - \sin x)(r + \sin x)}{(r - \sin x)(r + \sin x)} = \frac{r + \sin x}{r + \sin x}$

$= -\sin x \rightarrow \cos x = \cos(\frac{dR}{r}) = \boxed{-\frac{1}{r}}$

4) $f(x) = \frac{-1}{\sqrt{x+|x|}}$ $g(x) = \frac{1}{x^2 + |x|}$ $\rightarrow g'(\sqrt{x}) f'(g(\sqrt{x})) = ?$

$g'(\sqrt{x}) f'(g(\sqrt{x})) = (f'(g(\sqrt{x})))'$

$f \circ g = \frac{1}{\sqrt{\sqrt{x+|\sqrt{x}|} + |\sqrt{x+|\sqrt{x}|}|}} = \frac{1}{\sqrt{r \cdot 2^{\frac{1}{2}}}} = \frac{1}{2^{\frac{1}{4}} \sqrt{r}}$

$\rightarrow \frac{-\frac{1}{2\sqrt{r}}}{(2\sqrt{r})^2} = \frac{-\frac{1}{2\sqrt{r}}}{4r} = \frac{-1}{8r\sqrt{r}} = \boxed{\frac{1}{8\sqrt{r^3}}}$

۶) $f(x) = \left(\frac{-1 + \sin x}{1 + \sin x}\right)^2$, $f(x) = n \cdot g(n) + 1 \rightarrow \lim_{n \rightarrow \infty} g(n) = ?$

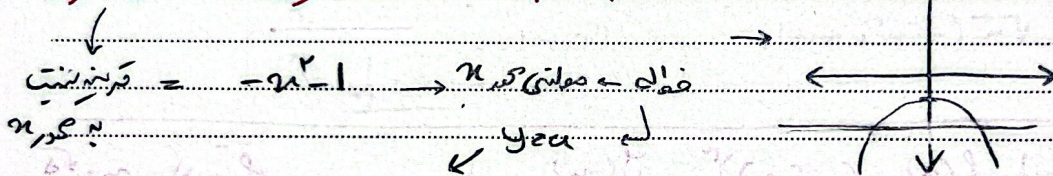
$\rightarrow g(n) = \frac{f(n) - 1}{n} \rightarrow \lim_{n \rightarrow \infty} g(n) = \frac{f(n) - 1}{n} \rightarrow$

$\lim_{n \rightarrow 0} g(n) = \frac{f(n) - f(0)}{n - 0} = f'(0) = ?$

$f\left(\frac{-1 + \sin x}{1 + \sin x}\right) = \frac{(\cos x(1 + \sin x)) - ((\cos x)(\sin x - 1))}{(1 + \sin x)^2}$

$f'x - 1 \times f' = \boxed{-f'}$

۷) $y = x^2 + 1 \rightarrow$ دایره f میوه!



$-x^2 - 1 = a \rightarrow x^2 = -1 - a$ \leftarrow Subst \rightarrow $x = \pm \sqrt{-1-a}$

$(\pm \sqrt{-1-a}, a)$: b و a نقطه

\leftarrow $-x\sqrt{-1-a}, x\sqrt{-1-a} \leftarrow -2ax = \text{مشتق}$

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

$-1-a = \frac{-1}{x} \rightarrow -a = \frac{-d}{x} \rightarrow a = \frac{-d}{x} \rightarrow \boxed{\frac{d}{x} = \text{مشتق}}$

۸) $f(x) = x \sqrt{x} (x^2 + 1) \rightarrow d \dots m, d = ?$

$m = \frac{f(a)}{a} = f'(a) \leftarrow$ مشتق

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

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

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$$\frac{r(r+1)\sqrt{a}}{a} \leftarrow \text{بدرجه ۱} \quad \frac{r}{a} \leftarrow \text{بدرجه ۰}$$

$$\rightarrow a \frac{1}{r} \rightarrow n \frac{f(n)}{a} = \frac{r}{\frac{1}{r}} \Rightarrow \boxed{r^2}$$

۱) $f(n) = \frac{\sqrt{an}}{-n^2+n+1} \rightarrow A(n; y) = ?$

$f'(a) = \frac{f(a)}{a}$ ← مشتق اول

$$\frac{\sqrt{an}}{-(n+1)(n-1)} \xrightarrow{\text{مشتق}} \frac{\left(\frac{1}{\sqrt{an}}\right) \cdot (-n^2+n+1) - \sqrt{an} \cdot (-2n)}{(-(n+1)(n-1))^2}$$

$$\frac{1}{\sqrt{n}(-n^2+n+1)} \rightarrow \text{مشتق اول} \rightarrow a \frac{1}{r}$$

$r = -1 \Rightarrow$
 $r = a \Rightarrow a \frac{1}{r}$

۱.۰) $f(n) = (n(n+1))^{\frac{r}{p}}$ $g(n) = \frac{1}{\sqrt{n^2-1}} \rightarrow f'(a) = n \frac{\sqrt{a}}{r} = ?$

$$\text{Log } z = \left(\frac{1}{\sqrt{n^2-1}} \times 1 \right)^{\frac{r}{p}} = \left(\frac{1}{\sqrt{n^2-1}} \right)^{\frac{r}{p}} \rightarrow (n^2-1)^{\frac{r}{p}}$$

مسئله ۱.۰

$$\left[\frac{1}{\sqrt{n^2-1}} \right]^{\frac{r}{p}} = 1 \rightarrow f' = -\frac{r}{p} (n^2-1)^{\frac{r}{p}-1} (2n) =$$

$$-\frac{r}{p} \times \frac{-1}{\sqrt{n^2-1}} \times \frac{\sqrt{a}}{r} = \frac{\sqrt{a} \times r}{r \times p} = \frac{\sqrt{a}}{p}$$

$$\frac{\frac{\sqrt{a}}{p}}{-\frac{r}{p}} = \boxed{\frac{-1}{r \times p}}$$