

سری

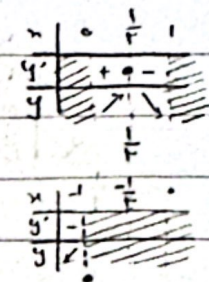
$$f(x) = \sqrt{x(1-|x|)}$$

$m, n \rightarrow$   $\int_{-1}^1 f(x) dx$

$k$   $\int_{-1}^1 f(x) dx$

$$k + m + n = ?$$

$$f(x) \begin{cases} x \geq 0 \rightarrow \sqrt{x(1-x)} = \sqrt{x-x^2} \rightarrow f'(x) = \frac{1-2x}{2\sqrt{x-x^2}} \\ x < 0 \rightarrow \sqrt{x(1+x)} = \sqrt{x+x^2} \rightarrow f'(x) = \frac{1+2x}{2\sqrt{x+x^2}} \end{cases}$$



$\int_{-1}^1 f(x) dx$   $\rightarrow$   $\int_{-1}^0 \dots + \int_0^1 \dots$   $\rightarrow$   $x \geq 1$

$\int_{-1}^1 f(x) dx$   $\rightarrow$   $\left\{ \frac{1}{2}, 0, 1, -1 \right\} \rightarrow k = f$

$\int_{-1}^1 f(x) dx$   $\rightarrow$   $\left\{ \frac{1}{2} \right\}$   $m+n+k = 0$

$\int_{-1}^1 f(x) dx$   $\rightarrow$   $\frac{1}{2}$

$$f(x) = \sqrt{x} + \sqrt{a-2x} \quad a > 0$$

$\rightarrow$   $\int_{-1}^1 f(x) dx = \sqrt{12}$

$[0, 1] = ?$

$\int_{-1}^1 f(x) dx$

$$a - 2x \geq 0$$

$$\frac{a}{2} \geq x$$

$$\left( \frac{a}{2} \leq x \leq \frac{a}{2} \right)$$

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

$$\sqrt{a-2x} = 2\sqrt{x}$$

$$a - 2x = 4x$$

$$a = 6x \rightarrow x = \frac{a}{6}$$

$\frac{1}{2}$

s.a.m

$$f(n) = \frac{x^n}{x^n - 1} |x^n - 1| \rightarrow \text{فرض } x^n > 1$$

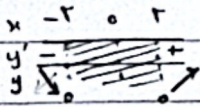
فرض

$$x^n > 1 \quad n > 1 \rightarrow \frac{x^n}{x^n - 1} (x^n - 1) = \frac{x^n - x^n}{x^n - 1} \rightarrow f'(n) = \frac{x^n - x^n + 1}{(x^n - 1)^2} = \frac{1}{(x^n - 1)^2} \quad (1)$$

$$-x^n < 1 \quad n < 1 \rightarrow \frac{x^n}{x^n - 1} (-x^n + 1) = \frac{-x^n + x^n}{x^n - 1} \rightarrow f'(n) = \frac{-x^n + x^n - 1}{(x^n - 1)^2} = \frac{-1}{(x^n - 1)^2} \quad (2)$$

مثال:  $x^n - x^n + 1 \xrightarrow{n=1} x^1 - x^1 + 1 \rightarrow 1 \rightarrow x \rightarrow$  مثال

(1)



(2)

