NO.

DATE

$\boxed{\text{IV}}$

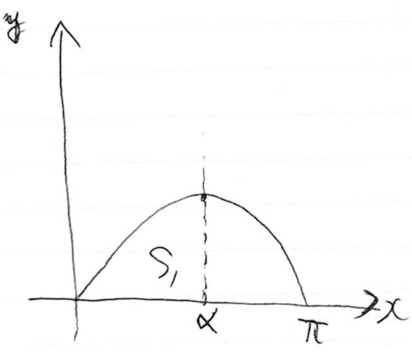
$$f(x) = \frac{\sin x}{3-2\cos x} \qquad (0 \leqq x \leqq \pi)$$

(1). $f(x)$の導関数

$$f'(x) = \frac{\cos x(3-2\cos x) - \sin x(2\sin x)}{(3-2\cos x)^2} = \frac{3\cos x - 2\cos^2 x - 2\sin^2 x}{(3-2\cos x)^2}$$

$$= \frac{3\cos x - 2}{(3-2\cos x)^2}$$

よって $f'(x)=0$ のとき、 $\cos x = \frac{2}{3}$.



(2).

$$S_1 = \int_0^{\alpha} f(x)\,dx$$

$$= \int_0^{\alpha} \frac{\sin x}{3-2\cos x}\,dx \qquad \cos x = t \text{ とおく.}$$

$-\sin x\,dx = dt$, $\quad x: 0 \to \alpha$

$t: 1 \to \frac{2}{3}$.

よって、 $S_1 = \int_1^{\frac{2}{3}} \frac{-dt}{3-2t} = \int_{\frac{2}{3}}^{1} \frac{dt}{3-2t} = \left[-\frac{1}{2}\log(3-2t)\right]_{\frac{2}{3}}^{1}$

$$= -\frac{1}{2}\left\{\log 1 - \log\frac{5}{3}\right\} = \frac{1}{2}\log\frac{5}{3},$$

また $S_2 = \int_{\alpha}^{\pi} f(x)\,dx = -\int_{\frac{2}{3}}^{-1} \frac{dt}{3-2t} = \int_{-1}^{\frac{2}{3}} \frac{dt}{3-2t} = \left[-\frac{1}{2}\log(3-2t)\right]_{-1}^{\frac{2}{3}}$

$$= -\frac{1}{2}\left\{\log\frac{5}{3} - \log 5\right\} = -\frac{1}{2}\log\frac{1}{3} = \frac{1}{2}\log 3$$