$0 \le x < 2\pi$

3. $f(x) = x + \frac{1}{\cos x}$

$\frac{P'Q - PQ'}{Q^2}$

① $f(x) = x + (\cos x)^{-1}$

$f'(x) = 1 - 1(\cos x)^{-2} \cdot \frac{d}{dx}(\cos x)$

$= 1 - (\cos x)^{-2} \cdot (-\sin x)$

$= 1 + \frac{\sin x}{(\cos x)^2}$ $\quad P$ / Q

$P' = \cos x \qquad Q' = 2(\cos x)^1 \cdot \frac{d}{dx}(\cos x)$

$= 2\cos x(-\sin x)$

$= -2\cos x \sin x$

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

$= \frac{\cos^3 x + 2\cos x \sin^2 x}{\cos^4 x}$

$= \frac{\cos x[\cos^2 x + 2\sin^2 x]}{\cos^4 x}$

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

② $\cos^2 x + 2\sin^2 x = 0$

$1 - \sin^2 x + 2\sin^2 x = 0$

$1 + \sin^2 x = 0$

$\sin^2 x = -1$

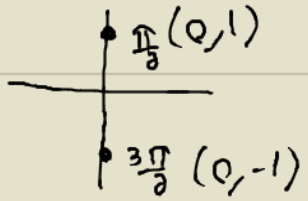
~~$\sin x = \pm\sqrt{-1}$~~

$\cos^3 x = 0$

$[\cos x]^3 = 0$

$\cos x = 0$

$x = \frac{\pi}{2}, \frac{3\pi}{2}$



③

$x = 0$	$x = \frac{\pi}{2}$	$x = \pi$	$x = \frac{3\pi}{2}$	$x = \frac{7\pi}{4}$	$x = 2\pi$
	$\frac{pos}{[\cos x]^3}$	$\frac{pos}{[\cos x]^3}$		$\frac{pos}{[\cos x]^3}$	
	pos	NEG		pos	
	∪	∩		∪	

Conc up $(0, \frac{\pi}{2})$

Conc down $(\frac{\pi}{2}, \frac{3\pi}{2})$

Conc up $(\frac{3\pi}{2}, 2\pi)$