$0 \le x < 2\pi$

7. $f(x) = 2\sin x - 2\cos x$

① $f'(x) = 2\cos x - 2(-\sin x)$

$= 2\cos x + 2\sin x$

$f''(x) = 2(-\sin x) + 2\cos x$

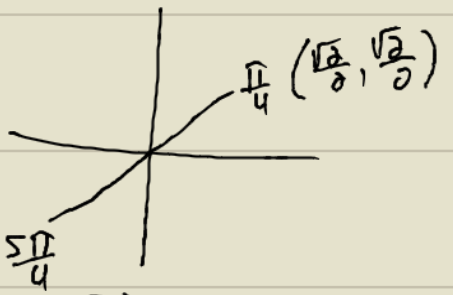
$= -2\sin x + 2\cos x$

② $-2\sin x + 2\cos x = 0$

$2\cos x = 2\sin x$

$\cos x = \sin x$

BY INSPECTION



$\cos^2 x = \sin^2 x$

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

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

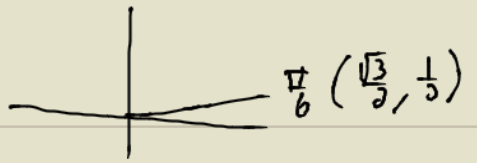
$1 = 2\sin^2 x$

$\frac{1}{2} = \sin^2 x$

$\pm\sqrt{\frac{1}{2}} = \sin x$

$\sin x = \pm\frac{\sqrt{1}}{\sqrt{2}}$

$\sin x = \pm\frac{\sqrt{2}}{2}$



$x = \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$

③

$x=0$	$x=\frac{\pi}{4}$	$x=\frac{5\pi}{4}$	$x=2\pi$
$x=\frac{\pi}{6}$	$x=\pi$	$x=\frac{3\pi}{2}$	
$-2\sin x + \cos x$	$-2\sin x + \cos x$	$-2\sin x + \cos x$	
$-2\sin\frac{\pi}{6} + \cos\frac{\pi}{6}$	$-2\sin\pi + \cos\pi$	$2 + 0$	
$-1 + \frac{\sqrt{3}}{2}$	NEG	Pos	
NEG	∩	∪	
∩			

CONC DOWN $\left(0, \frac{\pi}{4}\right)$

CONC DOWN $\left(\frac{\pi}{4}, \frac{5\pi}{4}\right)$

CONC UP $\left(\frac{5\pi}{4}, 2\pi\right)$

④ POI AT $x = \frac{5\pi}{4}$

$f\left(\frac{5\pi}{4}\right) = 2\sin\frac{5\pi}{4} - 2\cos\frac{5\pi}{4}$

$= \left(\frac{2}{\sqrt{2}}\right) - \left(\frac{2}{\sqrt{2}}\right) 2 =$

$0 = \sqrt{2} + \sqrt{2} =$

POI $\left(\frac{5\pi}{4}, 0\right)$