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(651) $y = ax^2 + \cos x \rightarrow y' = 2ax - \sin x \rightarrow y'' = 2a - \cos x$

$y''(\frac{\pi}{4}) = 0 = 2a - \frac{\sqrt{2}}{2} \rightarrow \boxed{a = \frac{\sqrt{2}}{4}}$

$y'' = \frac{2\sqrt{2}}{4} - \cos x = \frac{\sqrt{2}}{2} - \cos x = 0$

$\cos x = \frac{\sqrt{2}}{2} \rightarrow x = \pm \frac{\pi}{4} + 2\pi k$

$(\frac{\pi}{4}, 0.93)$

$(\frac{7\pi}{4}, 11.38)$

הסתירה

$y'' > 0$

$\frac{\sqrt{2}}{2} - \cos x > 0$

$\cos 45^\circ > \cos x$

$\rightarrow \frac{\pi}{4} < x < \frac{7\pi}{4} + 2\pi$

$\frac{\pi}{4} < x < \frac{7\pi}{4}$

U

$0 < x < \frac{\pi}{4}$

||

$\frac{7\pi}{4} < x < 2\pi$

(הסתירה) : \cap

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(652) $y = x^2 + a \cos^2 x \rightarrow y' = 2x + 2a \cos x \sin x \rightarrow y'' = 2 - 2a \cos 2x$

$y'' = 0 = 2 - 2a \cos 2x$

$2 = 2a \cos 2x = 2a \cos \frac{\pi}{3} \rightarrow \boxed{a = 2}$

$y'' = 2 - 4 \cos 2x = 0$

$\cos 2x = \frac{1}{2} \rightarrow 2x = \pm \frac{\pi}{3} + 2\pi k$

$x = \pm \frac{\pi}{6} + \pi k$

$(-\frac{\pi}{6}, 1.77)$

$(\frac{\pi}{6}, 1.77)$

הסתירה

$y'' > 0 \rightarrow 2 - 4 \cos 2x > 0$

$\frac{1}{2} > \cos 2x$

$\cos \frac{\pi}{3} > \cos 2x \rightarrow$

$\frac{\pi}{3} < 2x < 2\pi - \frac{\pi}{3}$

$\frac{\pi}{6} < x < \frac{5\pi}{6}$

|| $-2\pi + \frac{\pi}{3} < 2x < -\frac{\pi}{3}$

$-\frac{5\pi}{6} < x < -\frac{\pi}{6}$

$\frac{\pi}{2} < x < -\frac{\pi}{6}$ || $\frac{\pi}{6} < x < \frac{\pi}{2}$ "הסתירה"

$-\frac{\pi}{6} < x < \frac{\pi}{6}$

(הסתירה) : \cap