Deriv of Trig Fcns again

ex.1 Find the equation of the line that is tangent to the graph of $y = \tan x$ at $x = \frac{\pi}{4}$

$y' = \sec^2 x$

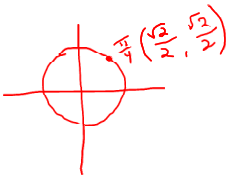
$m = \sec^2\left(\frac{\pi}{4}\right)$

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

$\cos\frac{\pi}{4} = \frac{\sqrt{2}}{2}$

$\sec\frac{\pi}{4} = \frac{2}{\sqrt{2}}$

$\sec^2\frac{\pi}{4} = \frac{4}{2}$



$m = 2$

$y = \tan x$

$y = \tan\frac{\pi}{4}$

$y = 1$

pt $\left(\frac{\pi}{4}, 1\right)$

$y - y_1 = m(x - x_1)$

$y - 1 = 2\left(x - \frac{\pi}{4}\right)$

ex.2 For what values of x does the graph of $f(x) = x + 2\sin x$ have a horizontal tangent?

$m = 0$

$m = f'(x)$

$f'(x) = 1 + 2\cos x$

$0 = 1 + 2\cos x$

$-1 = 2\cos x$

$-\frac{1}{2} = \cos x$

$x = \frac{2\pi}{3}, \frac{4\pi}{3}$

No interval given

$x = \frac{2\pi}{3} + 2k\pi$

$x = \frac{4\pi}{3} + 2k\pi$

$k \in \mathbb{Z}$

$x = (2n+1)\frac{\pi}{3} \pm \frac{\pi}{3}, \quad n \in I$

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