AP Calculus AB　　Mr. Shubleka　　Quiz: 19

Present neatly ~~on separate paper~~. Justify for full credit. No Calculators.

Name KEY / SHUBLEKA　　Score _______　　10 minutes

Use implicit differentiation to find an equation of the tangent line to the curve at the given point.

a)

$\sin(x + y) = 2x - 2y, \quad (\pi, \pi)$

b)

$y \sin 2x = x \cos 2y, \quad (\pi/2, \pi/4)$

a)

$\cos(x+y)\left(1+\frac{dy}{dx}\right) = 2 - 2\frac{dy}{dx}$ @ (π, π)

$\cos(2\pi)\left(1+dy/dx\right) = 2 - 2\,dy/dx$

$1 + \frac{dy}{dx} + 2\,dy/dx = 2 \Rightarrow dy/dx = \frac{1}{3}$　$\boxed{y - \pi = \frac{1}{3}(x-\pi)}$

b) $\frac{dy}{dx}\sin 2x + y \cdot \cos 2x \cdot 2 = \cos 2y + x \cdot (-\sin 2y) \cdot 2 \cdot \frac{dy}{dx}$

@ $(\pi/2, \pi/4)$: $\frac{dy}{dx} \cdot \sin \pi + \frac{\pi}{4} \cdot \cos \pi \cdot 2 = \cos \frac{\pi}{2} + \frac{\pi}{2}\left(-\sin\frac{\pi}{2}\right) \cdot 2 \cdot \frac{dy}{dx}$

$0 + \left(-\frac{\pi}{2}\right) = 0 - \pi \cdot \frac{dy}{dx}$

$\frac{dy}{dx} = \frac{1}{2}$

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