Calculus 2	Quiz 1	
		NAME
10 points	1 page	Ciara Swann

DIRECTIONS: Show all the work in the space provided. Box the final answers, and follow the directions.

1) Find $\int_{-2}^{2} \frac{1}{x^2+4x+13}dx$.

$\int \frac{dx}{x^2+4x+13} \rightarrow \int \frac{dx}{(x+2)^2+9}$

Let $x+2 = 3\tan\theta \quad dx = 3\sec^2\theta\, d\theta$

$\int \frac{3\sec^2\theta\, d\theta}{9\tan^2\theta+9} = \frac{1}{3}\int \frac{\sec^2\theta d\theta}{\tan^2\theta+1} = \frac{1}{3}\int \frac{\sec^2\theta\, d\theta}{\sec^2\theta} = \frac{1}{3}\int d\theta = \frac{1}{3}\theta$

$x+2 = 3\tan\theta \quad - \quad \theta = \arctan\left(\frac{x+2}{3}\right)$

$\frac{1}{3}\arctan\left(\frac{x+2}{3}\right)$

$\frac{1}{3}\arctan\left(\frac{2+2}{3}\right) - \frac{1}{3}\arctan\left(\frac{-2+2}{3}\right) = \boxed{\frac{1}{3}\arctan\left(\frac{4}{3}\right)}$

2) Find the derivative of the function $f(x) = x\arctan(2x) - \frac{1}{4}\ln(1+4x^2)$.

$1\cdot \arctan 2x + x\cdot \frac{1}{1+(2x)^2}\cdot 2 - \frac{1}{4}\cdot \frac{1}{1+4x^2}\cdot 8x =$

$\arctan 2x + \frac{2x}{1+4x^2} - \frac{2x}{1+4x^2} = \boxed{\arctan 2x}$