Math 181 Quiz 6 Version B

1. Use the facts that

$$\lim_{h \to 0} \frac{\sin h}{h} = 1 \qquad \text{and} \qquad \lim_{h \to 0} \frac{(\cos h) - 1}{h} = 0$$

and the limit definition of derivative to show that $f'(x) = \cos x$ when $f(x) = \sin x$.

2. Find the following derivatives using the rules of calculus:

(i) $\dfrac{d}{dx} \cos(1 - 3x)$

(ii) $\dfrac{d}{dx} \dfrac{\ln(1 + x)}{3 + x^2}$

(iii) $\dfrac{d}{dx} (9 + \arctan x)^x$