

Math 181 Quiz 6 Version C

1. Use the facts that

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

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)  $\frac{d}{dx} \sin(5 + 2x)$

(ii)  $\frac{d}{dx} \frac{\ln(5 + x)}{1 + x^2}$

(iii)  $\frac{d}{dx} (7 + \arctan x)^x$