

Math 181 Quiz 6 Version A

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) $\frac{d}{dx} \sin(1 + 3x)$

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

(iii) $\frac{d}{dx} (10 + \arctan x)^x$