1. Use the facts that

\[ \lim_{h \to 0} \frac{\sin h}{h} = 1 \quad \text{and} \quad \lim_{h \to 0} \frac{(\cos h) - 1}{h} = 0 \]

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) \[ \frac{d}{dx} \cos(1 - 3x) \]

(ii) \[ \frac{d}{dx} \frac{\ln(1 + x)}{3 + x^2} \]

(iii) \[ \frac{d}{dx} (9 + \arctan x)^x \]