Hand your completed quiz in before the due date. Do not forget to write down your name and student ID number. Marks will be awarded for this quiz based on the clarity of your answers. The marker will pay close attention to the logic of your answers. Please show all your working.

Q1. Prove that
(a) \( \tan \theta \sin \theta + \cos \theta = \frac{1}{\cos \theta} \).
(b) \( \frac{\tan x}{1 - \cos x} = \frac{1}{\sin x} (1 + \frac{1}{\cos x}) \).
(c) \( \frac{2 \tan x}{1 + \tan^2 x} = \sin 2x \).
(d) \( \sin x \tan \frac{x}{2} = 1 - \cos x \).
(e) \( 2 \sin^2 3x = 1 - \cos 6x \).
(f) \( (\sin \frac{x}{2} + \cos \frac{x}{2})^2 = 1 + \sin x \).

Q2. Let \( x = 2 \sin \theta, -\pi/2 < \theta < \pi/2 \). Simplify \( \frac{x}{\sqrt{4-x^2}} \).

Q3. Find
(a) \( \sin 8^\circ \cos 22^\circ + \cos 8^\circ \sin 22^\circ \).
(b) \( \sin 75^\circ \).

Q4. Solve
(a) \( (2 \cos \theta - 1)(\sin \theta - 1) \).
(b) \( 2 \cos^2 \theta + 5 \cos \theta + 2 = 0 \).
(c) \( \sin 2\theta - \cos \theta = 0 \).
(d) \( 2 \cos^2 x + \cos 2x = 0 \).