

**Problem 1:** (4 points) Find the limit if exists:

$$\lim_{x \rightarrow 0} \frac{\sin 2x}{\sin x}$$

**Problem 2:** (8 points) Find  $f'(x)$

1.  $f(x) = \sin(1 + \sec x)$

2.  $f(x) = \frac{\tan x}{1 + \cos x}$

**Problem 3:** (8 points) Evaluate the integrals:

1.  $\int \frac{\sin x}{1 - \cos x}$

2.  $\int \tan^3 x \sec^2 x dx$