Homework 11, Graded Problems

**Part I.** (20 pts.) Suppose that \( y = x - 2 \sin x \) on the domain \(-2\pi \leq x \leq 2\pi\).

1. Find all critical points. Show all work. Give exact answers. (In other words, I won’t accept calculator solutions.)

2. Determine where \( y \) is increasing and where it is decreasing. Write your answer in English using interval notation.

3. For each critical point, find the \( y \)-coordinate and determine the tangent slope.

4. Sketch a graph of \( y \) in which all of this is clearly visible.

**Part II.** (5 pts. + 5 bonus pts.) Given the graph of the **derivative** of \( g \) shown below, answer the following questions about \( g \).

1. Where are the critical points of \( g \)?

2. Where is \( g \) increasing? Decreasing?