

**Quiz**  
**October 17, 2007**

**Solutions of all problems must be accompanied by relevant explanations.**

**Problem 1.** Find the derivative of  $f(x) = \sin(\sin x + x)$ .

**Problem 2.** Jim and Tim start walking from a point P at the same time. Jim is walking north with velocity 4 meters per second, and Tim is walking east with velocity 3 meters per second. Find the rate of change of the distance between them 2 seconds after they started walking.

**Problem 3.** Jim and Tim are now standing in point Q where a straight south-north line touches a circle. Assume that the center of the circle is located 3 meters east of Q. Jim starts walking north along the line with the constant velocity and, at the same time, Tim starts walking along the circle clockwise with the constant velocity. After 1 second Jim is located 7 meters north from Q and Tim is located on the northmost point of the circle. Find the rate of change of the distance between them in this moment.