

Name: _____

Panther ID: _____

Worksheet week 12

Calculus I – Spring '15

To receive credit you **MUST SHOW ALL YOUR WORK.**

1. A particle is moving on a straight line with the given data. Find the position $s(t)$ of the particle at time t .

$$a(t) = 2 \cos t + \sin t, \quad v(0) = 1, \quad s(0) = 0.$$

2. Compute $\int \frac{\sec^2(3/x)}{x^2} dx$

$$\int \frac{x}{\sqrt{1-x^2}} dx$$

3. James Bond is at the southernmost point of a circular lake with diameter of two miles. He needs to get to the

northernmost point (diametrically opposite) of the lake as quickly as possible. It is known that James Bond runs twice as fast as he can swim. He can swim directly across the lake, he can run all the way around the lake, or he can try a combination of swimming and running. What path should James Bond take in order to minimize the time of the trip?