MAT 137 (Calculus II) Prof. Swift

In-class worksheet: Velocity, Position, and a Trigonometric Integral

1. Suppose the velocity of a particle is $v(t) = \sin(t)$. Find the position $x(t)$ of the particle, assuming the position at $t = 0$ is $x(0) = 0$. Sketch $x(t)$ for $0 \leq t \leq 3\pi$.

2. What is the distance traveled by the particle in the first t seconds, where $0 \leq t \leq \pi$?

3. What is the distance traveled by the particle in the first 3π seconds?

4. Evaluate $\displaystyle\int \sin^4(x)\cos(x)\,dx$