

Homework 5

Due February 26th at the beginning of class, or by 12:30 pm in MATH 602. Justify your answers. Please let me know if you have a question or find a mistake.

1. Let $c(t) = (4 \sin t, 5 \cos t, 3 \sin t)$.
 - (a) Find $\|c(t)\|$ and $\|c'(t)\|$.
 - (b) Find the equation of a plane containing the curve traced out by $c(t)$, and sketch the curve. Which coordinate axes and coordinate planes does the curve cross, and where does it cross them?
 - (c) Find the arc length of the curve.
2. Let C be the semicircle $x^2 + y^2 = 9, y \geq 0$.
 - (a) Evaluate $\int_C y ds$.
 - (b) Evaluate $\int_C x^7 ds$.
3. Let C be the line segment from $(1, 2, 3)$ to $(4, 2, 1)$.
 - (a) Evaluate $\int_C x^2 ds$.
 - (b) Evaluate $\int_C x^2 dx$.
 - (c) Evaluate $\int_C x^2 dy$.
 - (d) Evaluate $\int_C x^2 dz$.
 - (e) Evaluate $\int_C (z, y, x) \cdot ds$.