Reminders

- Your Exam 1 is due Thursday night (02/01/2024) by 9PM. Don't wait until the last minute!
- Show all your work for the weekly reviews! Grading is based completion and method, not just the final answer.
- Selected answers are provided on the last page. To discuss solutions for other problems, see your TA, visit office hours, or visit the MLC.
- Scan and upload this document by 11:59PM Thursday night (02/01/2024) to receive credit (online sections only).

Example 1. True / False: The surface given by the spherical equation $\rho = \dfrac{9}{\sin\phi}$ is part of a plane.
Make sure to explain your reasoning.

Example 2. Where does the helix $\boldsymbol{r}(t) = \langle \sin t, \cos t, 3t \rangle$ intersect the sphere $x^2 + y^2 + z^2 = 10$?

Example 3. Given $\boldsymbol{r}(0) = \langle 2, 3, 0 \rangle$ and $\boldsymbol{r}'(t) = \langle -3t^2, 2t, 1 \rangle$, find $\boldsymbol{r}(t)$. What is $|\mathbf{r}(2)|$?

Example 4.

(a) Determine the arc length of the curve $\boldsymbol{r}(t) = \langle 2t, \frac{2}{3}(t-5)^{3/2}, -t \rangle$ between $9 \leq t \leq 16$.

(b) If a particle moves along $\mathbf{r}(t)$ as above, find the time that has passed since the beginning ($t = 9$) when it has traveled a distance of 16 unit.

Example 5. Find the curve of intersection of the cylinder $x^2 + y^2 = 16$ and the plane $x + z = 5$.

Selected Final Answers: (rounded to 3 decimal places as on D2L quizzes)

Ex2: Hint: $t = \pm 1$ **Ex3:** 9.43398 **Ex4:** a) 24.666 b) 4.75245