

Math 2204: Written HW10 (Due Monday 4/21, 5pm)

No calculator or other electronic devices for written HWs.

Include a formula you use in the write-up of that problem.

Hand in **ALL WORK AND REASONING** for the following problems.

■ **Section 13.1:** 3, 8, 11, 21, 25, 26, 53.

For #8: First find an equation in x and y that represents the curve.

For problems A, B, C, and D: 1. Check if $\nabla g = \mathbf{0}$ on the constraint.

2. Show reasoning why a max and/or min exist or not.

3. Include the formula you use.

A) **Section 14.8:** 3.

B) **Section 14.8:** 23.

C) **Section 14.8:** 49.

D) Find the points on $3x + y + 2z = 10$ closest and farthest from the point $(0, 1, 1)$.

E) Let C be the curve parametrized by $\mathbf{r}(t) = \langle \sin t, 2t, \cos t \rangle$ with $-\pi \leq t \leq \pi$.

1. Sketch the surface along which the curve C runs.

2. Sketch, by hand and in the same figure, the curve C .

Include the orientation of the curve, relevant points on the curve, and the name of the curve.

F) Parametrize using a single vector function $\mathbf{r}(t)$ (thus no splitting into two parts):

1. The planar (2D) curve $(x - 2)^2 + y^2 = 4$.

2. The curve of intersection of $y = x^2$ and $y + z = 5$.

Include a sketch of each curve, the orientation of your $\mathbf{r}(t)$, and the bounds of the parameter.