



Department of Mathematics and Natural Sciences

MAT 110

ASSIGNMENT 5

SUMMER 2021

SET: 6 (MJM)

Please write your name and ID on the first page of the assignment answer script - you have to do this for both handwritten or L^AT_EX submission. The last date of submission is 5-9-2021, 1159 pm. Solve all problems.

You can only submit a PDF file - image or doc files won't be accepted. Before submitting the PDF, please rename the PDF file in the format - SET_ID_SECTION.

*Answer the questions by yourself. Plagiarism will lead to an F grade in the course. **Total marks is 300. Each question is worth 50 marks.** If you do your work using L^AT_EX you will get a mark which will be added as a L^AT_EXbonus to your course grade.*

If you use L^AT_EX, you must add a screenshot of the raw code and compiled pdf side by side, in order to earn your bonus.

This set was prepared by MJM. If you have any questions, please text MJM on Slack.

1. Write the equation into the standard form of the equation of the parabola:

$$-15 + 12x - 6y + y^2 = 0$$

Locate the vertex, focus and write down the equation of the directrix.

2. Write the equation into the standard form of the equation of the ellipse and sketch the ellipse:

$$256 + 9x^2 - 160y + 16y^2 = 0$$

3. Write the equation into the standard form of the equation of the hyperbola:

$$-24 - 24x + 12x^2 - 3y^2 = 0$$

Find the center, vertices, foci, eccentricity and equation of directrices for the hyperbola.

4. For the equation

$$r = \frac{9}{6 + 2 \cos \theta}$$

- (a) find the eccentricity, (b) identify the conic, (c) give an equation of the directrix, and (d) sketch the conic.
5. Find the rectangular coordinates of the point $(\pi, \frac{\pi}{2}, -2)$ which is in cylindrical coordinates.
6. Find the rectangular coordinates of the point $(\frac{5\pi}{6}, \frac{\pi}{2}, \pi)$ which is in spherical coordinates.