MATH 224 Spring 2026

Assignment 3

Due: Monday, February 16

Reading

Read carefully Sections 2.4 "Velocity, Speed and Acceleration," Section 2.5 "Integrals," and Subsection 2.6.1 "Projectile Motion" in our text *Multivariable Calculus: A Linear Algebra Based Approach.*

Writing

Write out careful and complete solutions of Exercises 21, 23, 26, 30, 31 in Chapter 2.

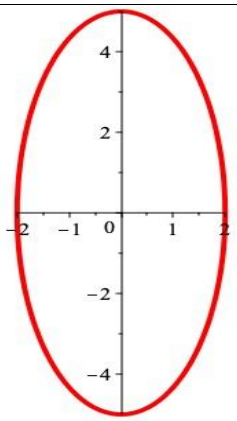

Image of
f(t) = (2 sin t, 5 cos t),
$0 \le t \le 2\pi$

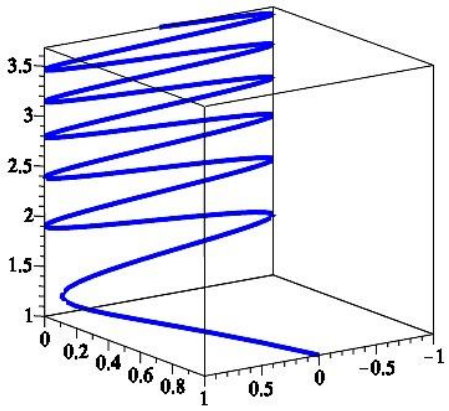

Image of $f(t) = (\sin 3t, e^{-4t}, \sqrt{t+1})$,
$0 \le t \le 4\pi$

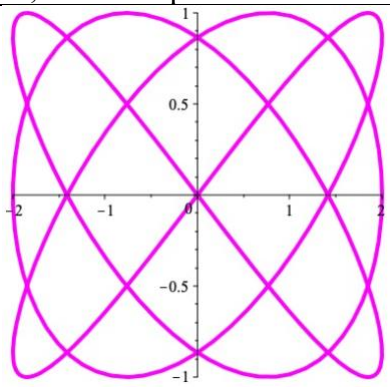

Image of
$f(t) = \left(\sin\left(3t + \frac{\pi}{2}\right), \sin 4t\right)$,
$0 \le t \le 4\pi$

Some Answers and Hints

21. (1): There is a problem when $t = 0$. (2) Certain multiples of $\pi/2$ may be troublesome. (3) What is the domain of the natural logarithm function? When are fractions undefined?

23. Show that the set satisfies the definition of a vector space. As for dimension, let *n* be a positive integer and consider the linear dependence or independence of the set of functions $\{x^1, x^2, \ldots x^n\}$.

26. Use ordinary rules of differentiation.