MATH 223   Spring 2025
Assignment 29
Due: Monday, May 5

Reading

Read carefully Section 8.1 "Divergence and Curl" in our text *Multivariable Calculus: A Linear Algebra Based Approach.*

Writing

Write out careful and complete solutions of Exercises 23 and 30 of Chapter 7 along with Exercises A – D below.

A. A curve γ has the parametrization $g(t) = (t, 4\cos t, 4\sin t)$. Sketch the curve, find its curvature and show it is constant.

B. Sketch the curve with parametrization $g(t) = (t^2, t), -2 \le t \le 2$ and find its curvature. At $t = 0$ and at $t = \sqrt{6}$.

C. Suppose the curve C in the plane is the graph of the real-valued function $y = f(x)$ of one variable. Show that its curvature is $\dfrac{|f''(x)|}{(1 + |f'(x)|^2)^{3/2}}$.

D. If C is a curve in 3-dimensional space with parametrization $g(t)$, show that its curvature is given by $\dfrac{|g'(t) \times g''(t)|}{|g'(t)|^3}$.
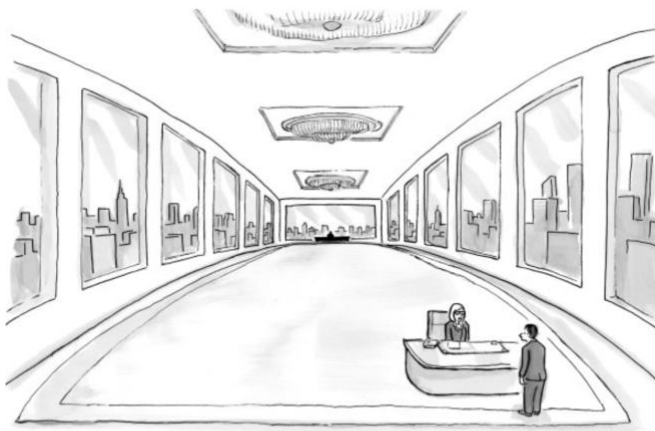
"He's not seeing anyone right now, due to the curvature of the earth."