

Multivariable functions

1. Examples of multivariable functions

- What is a parametric curve?
- What is a vector field?

2. Graphs of functions

- How to draw the surface?
- What is a level set?

Integrals on multivariable functions

1. How to compute the *length* of a curve?

- How do define length?

2. How to compute the area of 2-dimensional domain?

- What is an *iterated* integral?

3. How to compute the volume under the surface?

- What is a *multiple* integral?
- What is a difference between iterated integral and multiple integral?

Homework

- Reading assignment
 - Chapter §2.1 ~§2.2
 - Writing assignment (due **Sep. 14th, 11:59pm**)
 - Answer the following questions. Type or write neatly, convert to pdf, then upload to LMS.
1. (6 points) Let H be a plane in \mathbf{R}^3 defined by the equation

$$ax + by + cz + d = 0$$

for $a, b, c, d \in \mathbf{R}$.

- (a) In what condition does the vector

$$\mathbf{v} = (v_1, v_2, v_3)$$

is *parallel* to the plane H ?

- (b) Determine the formula of a, b, c, d when the plain H passes through the origin $\mathbf{0} = (0, 0, 0)$ and is parallel to

$$\mathbf{v} = (v_1, v_2, v_3), \quad \mathbf{w} = (w_1, w_2, w_3).$$

2. (6 points) Given an irregular domain such as figure below, explain how to compute the area using iterated integral (or double integrals).

