

Math 2233 Fall 2022
Multivariable Calculus Section 12
Mastery Quiz 1
Due Wednesday, September 7

This week's mastery quiz has one topic. Please do your best on that topic. Don't worry if you make a minor error, but try to demonstrate your mastery of the underlying material.

Feel free to consult your notes, but please don't discuss the actual quiz questions with other students in the course.

Remember that you are trying to demonstrate that you understand the concepts involved. For all these problems, justify your answers and explain how you reached them. Do not just write "yes" or "no" or give a single number.

Please turn this quiz in class on Wednesday. You may print this document out and write on it, or you may submit your work on separate paper; in either case make sure your name and recitation section are clearly on it. If you absolutely cannot turn it in in person, you can submit it electronically but this should be a last resort.

Topics on This Quiz

- Major Topic 1: Vectors

Name:

Recitation Section:

Major Topic 1: Vectors

- (a) Find a vector from the point $P = (1, -5, 2)$ to the point $Q = (-2, 1, 4)$.
- (b) Let $\vec{v} = 3\vec{j} - 2\vec{k}$. If we start at the point $(2, 1, 1)$ and then follow the vector $-2\vec{v}$, where do we end?
- (c) Find the orthogonal decomposition of $\vec{v} = 4\vec{i} + \vec{j} - \vec{k}$ with respect to $\vec{u} = 2\vec{i} - \vec{j} + 3\vec{k}$.
- (d) Find $\cos \theta$ where θ is the angle between $\vec{u} = \vec{i} - 2\vec{j} + \vec{k}$ and $\vec{v} = 5\vec{i} + 2\vec{j} - 6\vec{k}$.