

M427L (55200), Homework #3

Due: 12:00pm, Wednesday, Sep. 14

Instructions: Questions are from the book "Vector Calculus, 5th ed." by Marsden and Tromba. Please show all your work, not only your final answer, to receive credit. Keep answers organized in the same order the problems have been assigned.

Geometry of real-valued functions (2.1)

p. 105-107, #2, 4, 9, 17, 18, 23, 32

Limits and continuity (2.2)

p. 125-127, #8, 10, 17

Differentiation (2.3)

p. 139-141, #2, 3, 5, 9, 10

In addition:

- Find an equation for the plane tangent to $z = x^2 + y^2$ which is normal to the vector $\mathbf{n} = (-1, 1, 2)$.
- Where does the plane tangent to $z = x^2 - 4xy + 4y^2 + 2$ at point $(1, 1, 3)$ intersect the line passing through the points $(-2, -1, 0)$ and $(1, 0, 2)$?