

Name : _____

240 - Calculus III: Test 1 Extra Credit

DIRECTIONS: Show all work! There is a total of 10 points which will be added to Test 1.

1. (2 points) Let $f(x) = \int_0^x \sqrt{t^4 + 1} dt$.

a) Find a unit vector parallel to the graph of f at $(0,0)$.

b) Find a unit vector perpendicular to the graph of f at $(0,0)$.

2. (3 points) There is a line in 3D space (written below) that is embedded in a 2D plane:

$$x = 4t + 1, y = t - 2, \text{ and } z = -3t - 3$$

This plane also contains the point $(2,-3,5)$. Find the equation of the plane.