

Math 8
Fall 2019

Written Homework
Assigned Friday, November 1

Note: Standard (not preliminary) written homework is graded on your work and your explanations, not just on your answer.

Explanations are important for many reasons. Being able to communicate what you know shows a depth of understanding beyond that of being able to get the right answer to a problem. Doing the mental work of putting explanations into words helps create that depth of understanding. On exams, we will grade your work and not just your answers, so this is good practice for taking exams.

For all these reasons, be sure to: show all your work; explain your reasoning; use clear English; write neatly so all this effort does not go to waste.

Written homework is always due at 10:00 AM on the following Monday.

Assignment: Let $f(x, y) = x^2 - y^2$, let γ_1 be the intersection of the graph of f with the plane $x = 2$, and let γ_2 be the intersection of the graph of f with the plane $y = 1$.

(1.) Parametrize γ_1 , and use this parametrization to find a vector parametric equation for the line tangent to γ_1 at the point $(2, 1, 3)$.

(2.) Parametrize γ_2 , and use this parametrization to find a vector parametric equation for the line tangent to γ_2 at the point $(2, 1, 3)$.

(3.) Find an equation in the form $ax + by + cz = d$ for the plane containing the two lines you found in problems (1) and (2).

(4.) Rewrite the equation you found in (3) in the form $z = h(x, y)$. Use the limit definition of tangent plane to show the graph of h is tangent to the graph of f at the point $(2, 1, 3)$.