

Tangent Plane and Tangent Line

GROUP MEMBERS:

1. _____
2. _____
3. _____
4. _____

Problem: Determine the tangent plane to the surface given by $z = f(x, y) = 3x^2y^3 - 2x + y$ at the point $(x_0 = 1, y_0 = 2, z_0 = f(x_0, y_0))$.

Directions: Person 1 take this sheet and do problem 1. Explain to the group what you are doing. Ask your group for help if you are not clear about what to do. Then pass the sheet to person 2 who does the second problem and explains to the group. Then pass to the third person and so on.

Person 1: Calculate $\frac{\partial f}{\partial x} =$

Person 2: Calculate $\frac{\partial f}{\partial y} =$

Person 3: Evaluate $\frac{\partial f}{\partial x}$ and $\frac{\partial f}{\partial y}$ at the point $(x_0 = 1, y_0 = 2)$.

Person 4: Write the equation for the tangent plane:

$z =$

Problem: Determine the tangent vector and tangent line to a curve given by

$r(t) = (x(t), y(t), z(t)) = (\cos(t), \sin(t), t)$
at the point $r(t = \pi/2)$.

Person 1: Find the point of interest: $r(\pi/2) =$

Person 2: Calculate the tangent vector $r'(t) =$

Person 3: Calculate the tangent vector at $t = \pi/2$: $r'(\pi/2) =$

Person 4: Write the equation of the tangent line through the point $r(\pi/2)$.