

Math 252 Practice Test 2

1. The toxicity of an environment is given by the formula $T(x, y) = \sin(x^3 - 2y^3)$. If a bug is located at the point $(1, -1)$ and wishes to go in the direction of least toxicity, in what direction should it go?
2. Find the tangent plane to the surface $x^3 + y^3 + z^3 = 3$ at the point $(1, 1, 1)$.
3. Find the first order Taylor expansion of $f(x, y) = e^y \cos x$ about $(0, 0)$.
4. Find and classify the relative extrema of $f(x, y) = e^{x^2 - y^2}$.
5. Find the extrema of $f(x, y) = x^2 - y$ if $x^2 + y^2 \leq 25$.
6. Evaluate $\iint_D \sin(x + y) dx dy$ if D is the region $[0, 1] \times [0, 1]$.
7. If $z = \cos xy + y \cos x$, where $x = u^2 + v$ and $y = u - v^2$, use the chain rule to find the first order partial derivative of z .
8. Evaluate $\int_1^2 \int_0^1 (x + y)^{-2} dx dy$.