

Homework 3

MATH 120

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1. Find an affine map that represents the linear approximation of $f(x, y) = \sin x - \cos y^2$ near $(0, 0)$.
2. Find the Hessian of $f(x, y, z) = xe^{y^2+z^2}$.
3. Problem 5.3 on page 68.
4. Problem 5.4 on page 68.
5. Problem 5.5 on page 68.
6. Find an integer power of x such that $f(x) = (\sin x^2, e^x - x - 1, x^3 - x^5)$ is $O(x^i)$.
7. Find an integer power of x such that $f(x) = (x^3 \cos x, x \sin(x^2))$ is $o(x^i)$.
8. Problem 5.6 on page 68.
9. Problem 5.8 on page 69.
10. Problem 5.9 on page 69.