

Name _____

Homework 5
Sections 14.5 – 14.7

1. (6) Determine the equation of the plane which is tangent to the graph of

$$2xz + y^3 e^{2z-6} = x^4 - 5y - 16$$

at the point $(1, -2, 3)$. Write your answer in the form $ax + by + cz = d$.

2. (6) Determine the directional derivative of

$$f(x, y, z) = \frac{x^2 + z^2}{y} + xyz + 5xz^2$$

at $(3, 2, 1)$ in the direction of $\vec{v} = 8\vec{i} + 4\vec{j} + \vec{k}$.

3. (7) Find the quadratic Taylor polynomial, $Q(x, y)$, about $(5, 2)$ for the function $f(x, y) = \sqrt{(2x - 3y)^3}$.

4. (6) Determine the best quadratic approximation of $g(x, y) = x + \sin(xy + 2) + xy^3 - 5x^2$ near $(2, -1)$.