1. Sketch the level curves corresponding to $c = 0, 1, 4, \text{ and } 9$ for $f(x, y) = (x/2)^2 + y^2$.

2. Find the limit or show that it does not exist.

(a) \[ \lim_{(x,y) \to (1,0)} e^{y^2 - x \arctan \left( \frac{x}{y^2} \right)} \]

(b) \[ \lim_{(x,y) \to (0,0)} \frac{xy}{x^2 + y^2} \]

[HINT: Consider two paths, lines will do.]
3. Compute the specified partial derivatives.

(a) \[ f(x, y, z) = x^2 + \sin(x^2y + yz^2) + e^{4z}, \quad f_x \]

(b) \[ f(x, y, z) = \frac{x^2y^3}{z} + \sin \left( \frac{y^2 + e^z}{y^2 + z^2 + 1} \right), \quad f_{yzzxy} \]

4. Find an equation for the tangent plane to \( f(x, y) = x^2 + \sin x \) at \((1, 0)\).