Consider the function

\[ f(x, y, z) = \frac{xyz}{x^2 + y^4 + z^4}. \]

(a) Find the limit of \( f \) as \((x, y, z) \to (0, 0, 0)\) along all lines through the origin.

(b) Does the limit

\[ \lim_{(x, y, z) \to (0, 0, 0)} f(x, y, z) \]

exist? (Hint. Consider the curve \( x = t^2, y = t, z = t \).)