

Bilkent University Department of Mathematics

MATH 102-14: Calculus II

Quiz 4 - April 7, 2026

Instructor: Enis Kaya

Name and surname: _____

Student ID number: _____

Signature: _____

Show all your work. Explain your reasoning fully with well-formed mathematical sentences and using correct notation. Organize your solution on the page properly. Write clearly and cleanly.

Questions:

1. [4 points] Find the limit $\lim_{(x,y) \rightarrow (0,0)} \frac{xy^5}{x^4 + x^5y + y^6}$ if it exists.



2. [2 points] Determine if $f(x, y) = x^2 \sin(\pi/y)$ is increasing or decreasing at the point $(-2, 3/4)$ if we allow x to vary and hold y fixed.
3. [4 points] If $z = x^{-2}y^6 - 4x$, $x = u^2v$ and $y = v - 3u$, determine $\frac{\partial z}{\partial u}$ and $\frac{\partial z}{\partial v}$.

Solution: