Q1) Find and sketch the domain of the function \( f(x, y) = \frac{\sqrt{x-2} + \sqrt{y-1}}{x-y} \).

Q2) Find the limit, if it exists, or show that the limit does not exist:

\[
\lim_{(x,y)\to(0,0)} \frac{4y^4 \cos^2 x}{x^4 + y^4}.
\]

Q3) Find the direction and the value of the maximum rate of change to the function

\[ f(x, y, z) = e^{xy} + \sin(yz) + 2^z \]

at the point (1, 0, 2).