
Show all work. 5 points each.

1. Find $\frac{\partial z}{\partial u}$ if $z = x^4 + x^2y$ when $s = 4$, $t = 2$, $u = 1$ and $x = s + 2t - u$,
 $y = stu^2$.

2. Find the maximum rate of change for $f(x, y) = 4y\sqrt{x}$ and the direction in which it occurs at the point $(4, 1)$.