

**Name:**

1. Let  $g(x, y) = xy^2 \cos(xy)$ , where  $x = \sqrt[3]{uv}$  and  $y = \sqrt[3]{\frac{u}{v^2}}$ . Compute  $\frac{\partial g}{\partial u}$  and  $\frac{\partial g}{\partial v}$  using the Chain Rule. (You do not need to write  $x$  and  $y$  in terms of  $u$  and  $v$  in the last step.)

2. Calculate the gradient of the function  $f(x, y) = 3x^2 - 4xy$  at the point  $(1, 2)$ .