

1. Find f_x and f_y if $f(x,y) = y(x^3 + y)^2$.

2. If $f(x,y) = y^2e^x + \ln(xy)$, find $f_{xyy}(1, 1)$.

2. If $c = 0.001 q^3 - 0.03q^2 + 2 q + 5000$ is a total cost function, find the marginal cost when $q = 100$.