MATH 105A and 110A Review: The determinant and invertibility

1. Find the inverse of the Jacobian matrix of $F(x, y) = (2xy, x + y)$ when possible.
2. Find the inverse of the Jacobian matrix $F(x, y, z) = (z, yz + 2, 3xyz)$ at the point $(1, 1, 1)$.