1. Find a vector \( v = (v_1, v_2) \) such that the slope of \( f(x, y) = x^2 y \) at the point \((-1, 1)\) is zero in the direction of \( v \).

2. Find the vector normal to each of the following surfaces at the specified point.
   
   (a) \( f(x, y) = e^{x-y} \) at \((1, 1, 1)\)
   
   (b) \( 4x - y + 2z = 12 \) at \((3, 2, 1)\)
   
   (c) \( z^2 = x^2 + y^2 \) at \((2, 0, -2)\)
   
   (d) \( \ln(x^2 + 2y^2 + 3z^2) = 0 \) at \((1, 0, 0)\)

3. Find the plane tangent to each of the following surfaces at the specified point.
   
   (a) \( f(x, y) = x^2 + 3xy + y^3 \) at \((3, -1, -1)\)
   
   (b) \( 4x^2 + y^2 + z^2 = 9 \) at \((1, 1, 2)\)
   
   (c) \( xyz = 1 \) at \((2, 1, \frac{1}{2})\)