1. (5 points) Use implicit differentiation to find the equation of the tangent line to the curve given by:
\[ x^2 + 2xy - y^2 + x = 2 \]
at the point (1, 2).
\[
2x + (2x \frac{dy}{dx} + 2y) - 2y \frac{dy}{dx} + 1 = 0
\]
\[
\frac{dy}{dx} (2x - 2y) = -2x - 2y - 1
\]
At (1,2) : \( \frac{dy}{dx} (-2) = -7 \), \( \frac{dy}{dx} = \frac{7}{2} \)

The tangent is \( y - 2 = \frac{7}{2} (x - 1) \) or \( y = \frac{7}{2} x - \frac{3}{2} \)

2. (5 points) Find the derivative of:
\[ y = \tan^{-1}(x^2) \]
\[
\frac{dy}{dx} = \frac{1}{1 + (x^2)^2} \cdot 2x = \frac{2x}{1 + x^4}
\]