Provide a clear and organized presentation. Show all of your work and give exact values only. Do not use any shortcuts for differentiation (i.e., if you need to differentiate a function, use our limit definition of the derivative function).

Determine the equation of the tangent line to the graph of $y = f(x)$ that passes through the point $(2,1)$ if $f(x) = \dfrac{x^2}{x^2 + 1}$