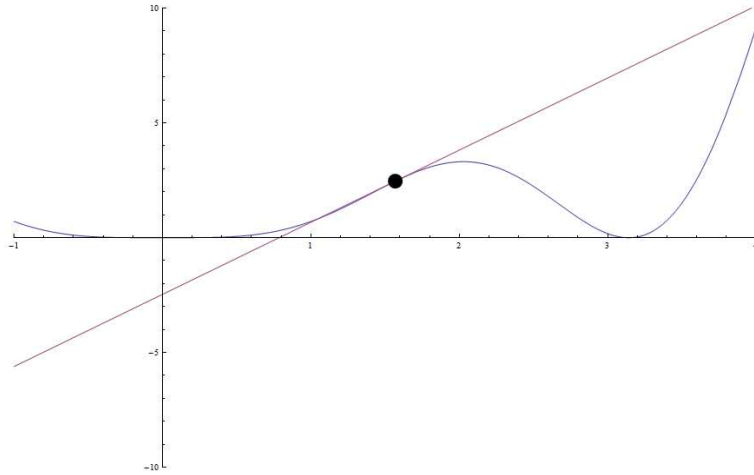Read each problem **very carefully** before starting to solve it. Each problem is worth 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. Find an equation for the tangent line to the graph of $f(x) = x^2 \sin^2 x$ at $x = \frac{\pi}{2}$.

2. Find the slope of the tangent line to $f(x) = (\sqrt{x+1} - 1)^{3/2}$ at $x = 3$.