For the following exercises do NOT use your calculator.

1. Let $f(x) = \tan(x^2)\sin(x)$ for $x \in \left(-\sqrt{\frac{\pi}{2}}, \sqrt{\frac{\pi}{2}}\right)$. Determine $f'(x)$.

2. Let $g(x) = (\sin(\cos(x)))^2 + (\cos(\cos(x)))^2$. Determine the domain of $g(x)$ and explain why g is differentiable. Moreover, determine $g'(x)$.