Writing Exercise 3

1. The functions $f(x) = 2\sin x$ and $g(x) = \cos x$ cross each other many times. Find a value $c$ such that the tangent lines to $f$ and $g$ at $x = c$ are perpendicular. Describe how you found that value. Give equations of both tangent lines.

2. Why is there no point $c$ such that the tangent lines to $\sin x$ and $\cos x$ at $x = c$ are perpendicular?

3. There is a point $c$ such that the tangent lines to $\sin x$ and $3\cos x$ at $x = c$ are perpendicular? Describe how the intermediate value theorem guarantees this point $c$. 