(1) Let X be a compact Riemann surface of genus g, and let $\phi : X \to \mathbb{CP}^1$ be a map of degree 3 with only simple branch points (i.e. where at most two points collide in each fiber). Determine the number of branch points.

(2) Do a naïve dimension count for the space of trigonal curves of genus g for all $g \geq 3$. For which genera does one expect all curves to be trigonal? You may invoke the Brill-Noether heuristics. [Hints: Assignment 7, problem 2 is relevant. Also, be careful in genus $g = 3$!]