My platonic relationship with nearly Platonic graphs

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A Platonic graph (or Platonic solid) is a vertex-regular planar graph with all faces of the same size. It is well known that there exist exactly five such graphs: tetrahedron, octahedron, hexahedron, icosahedron, and dodecahedron.

Recently, William Keith asked whether there exist nearly Platonic graphs that would differ from Platonic in just one face. That is, vertex-regular planar graphs with all faces except one having the same size. We will show that the answer is ńo,ą̣nd ask (and partially answer) similar questions about 2- and 3-nearly Platonic graphs. In other words, about vertex-regular planar graphs with exactly two or three exceptional faces.