1116-F5-1964 **Maria Nogin*** (`mnogin@csufresno.edu`), Department of Mathematics, 5245 North Backer Avenue M/S PB 108, CSU Fresno, Fresno, CA 93740. *It is not a coincidence! On patterns in some Calculus optimization problems.*

Have you ever noticed that some families of optimization problems always have results (optimal dimensions) that follow an interesting (and sometimes quite unexpected) pattern? For example, the diameter of an optimal cylindrical can (one with the greatest possible volume given the surface area or, equivalently, one with the smallest possible surface area given the volume) is equal to its height. In this talk we show that this and some other patterns in optimization problems are not a coincidence, and, in fact, in many problems the optimal shape could be determined without any calculations. To show this we use symmetry, similarity, and other concepts and relationships that excite students more than a calculus-based computation. As an added bonus, our ideas allow us to have answers (optimal dimensions) to many new related problems, all at once, without any new computations. (Received September 21, 2015)