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Derivative of area equals perimeter – coincidence or rule?

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From the text: Why is the derivative of the area of a circle equal to its circumference? Why is the derivative of the volume of a sphere equal to its surface area? And why does a similar relationship not hold for a square or a cube? Or does it? In their work in teacher education, these authors have heard at times undesirable responses to these questions: “That’s the way it is. Circles and spheres are very special. Squares and cubes have corners.” Or, “It is a simple coincidence with circles. This relationship does not hold for any other shapes.” In this article, we explore and explain the familiar relationship of the area of a circle and its circumference and of the volume of a sphere and its surface area. We then extend this relationship to other two- and three-dimensional figures – squares and regular polygons, cubes and regular polyhedra. (ERIC)

Classification: I44 G44

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