

ZMATH 2013a.00618

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If not, then what if as well? Unexpected trigonometric insights.

Math. Enthus. 9, No. 1/2, 19-36 (2012).

Summary: In performing an exercise of “what if not”, one can end up with a paucity of structure. Adding alternative structure can be a rich source of discovery, as we present here. The framework of this presentation is the original voyage of discovery, from a trivial geometric problem to the derivation of some unexpected trigonometric formulae based on regular polygons. The original “voyage” has been changed only sufficiently to make the text readable.

Classification: G60

Keywords: trigonometric identities; problem posing; Euclidean geometry