ZMATH 2016b.00612

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Improving an approximate formula.

Math. Sch. (Leicester) 40, No. 3, 29 (2011).

From the text: In a recent issue of this journal, [M. Rose, "Miscellany", ibid. 39, No. 1, 27 (2010)] offered an interesting approximate formula: $\tan x = \frac{10+x}{100-x} (25 \leq x \leq 65)$. But can we improve this formula without resorting to calculus? It seems reasonable to assume that a more accurate formula might take the form: $\tan x = \frac{x^2+Ax+B}{x^2+Cx+D}$.

Classification: G60 N50
Keywords: trigonometry; trigonometric functions; tangent; function values; approximate values; rational approximations; rational functions; percentage error