

Cal Poly Department of Mathematics

Puzzle of the Week

October 23 - 29, 2009

Set $P(n) = \prod_{k=1}^n k^k = 1^1 \cdot 2^2 \cdot 3^3 \cdot \dots \cdot n^n$. Define $E(n)$ to be the largest positive integer k for which 5^k divides $P(n)$. Find a closed-form formula for $E(5^m)$ and evaluate

$$\lim_{m \rightarrow \infty} \frac{E(5^m)}{5^{2m}}$$

Solutions should be submitted to Morgan Sherman:

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before next Friday. Those with correct and complete solutions will have their names listed in next week's email announcement. Anybody is welcome to make a submission.