

Solusi Soal Matematika 271118 SMP HOTS: Closed Book

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1. Hitunglah nilai dari $\frac{2014^4 + 4 \times 2013^4}{2013^2 + 4027^2} - \frac{2012^4 + 4 \times 2013^4}{2013^2 + 4025^2}$ tanpa kalkulator!

gunakan Teorema Sophie Germain

$$a^4 + 4b^4 = (a^2 - 2ab + 2b^2)(a^2 + 2ab + 2b^2)$$

Umpamakan $n = 2013$

$$\frac{(n+1)^4 + 4n^4}{n^2 + (2n+1)^2} - \frac{(n-1)^4 + 4n^4}{n^2 + (2n-1)^2}$$

$$\frac{((n+1)^2 - 2(n+1)(n) + 2n^2)((n+1)^2 + 2(n+1)(n) + 2n^2)}{5n^2 + 4n + 1} - \frac{((n-1)^2 - 2(n-1)(n) + 2n^2)((n-1)^2 + 2(n-1)(n) + 2n^2)}{5n^2 - 4n + 1}$$

$$\frac{(n^2 + 1)(5n^2 + 4n + 1)}{(5n^2 + 4n + 1)} - \frac{(n^2 + 1)(5n^2 - 4n + 1)}{(5n^2 - 4n + 1)}$$

$$(n^2 + 1) - (n^2 + 1) = 0$$