LATIHAN INDUKSI MATEMATIKA

Dengan menggunakan induksi matematika, buktikan bahwa pernyataan-pernyataan berikut benar untuk setiap bilangan asli n.

1. $1^3 + 2^3 + 3^3 + \cdots + n^3 = \frac{n^2(n+1)^2}{4}$
2. $1 + 2 + 4 + \ldots + 2^{n-1} = 2^n - 1$
3. $4 + 7 + 10 + \ldots + (3n + 1) = \frac{1}{2}(3n^2 + 5n)$
4. $\frac{1}{1.2} + \frac{1}{2.3} + \frac{1}{3.4} + \cdots + \frac{1}{n(n+1)} = \frac{n}{n+1}$
5. $n^3 + 5n$ habis dibagi 6
6. $5^{2n} - 1$ habis dibagi 3
7. $n < 2^n$
8. $\frac{1}{\sqrt{1}} + \frac{1}{\sqrt{2}} + \frac{1}{\sqrt{3}} + \cdots + \frac{1}{\sqrt{n+1}} > \sqrt{n+1}$
9. $\frac{1}{2^1} + \frac{2}{2^3} + \frac{3}{2^3} + \cdots + \frac{n}{2^n} = 2 - \frac{n+2}{2^n}$
10. $1 + 2.2 + 3.2^2 + 4.2^3 + \ldots + n.2^{n-1} = 1 + (n-1).2^n$

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