A Level Maths

Topic: Sigma Notation

Instructions

Answer all questions. Show all necessary steps. Use properties of sigma notation to simplify and evaluate expressions.

Practice Problems

Evaluating and Expanding Sigma Expressions:

1. Evaluate $\sum_{k=1}^{5} k$
2. Expand and evaluate $\sum_{n=1}^{4} (2n+1)$
3. Find the value of $\sum_{r=1}^{6} 3r^2$
4. Simplify: $\sum_{i=1}^{3} (i^2 + 2i)$

Properties and Manipulations of Sigma Notation:

5. Express the sum $1 + 4 + 7 + 10 + 13$ in sigma notation and evaluate it.
6. Rewrite $\sum_{k=1}^{n} (3k+2)$ as two separate sigma expressions.
7. Prove that $\sum_{r=1}^{n} (2r-1) = n^2$

8. Find the value of $\sum_{k=1}^{10} k^2$ using the formula $\sum_{k=1}^{n} k^2 = \frac{n(n+1)(2n+1)}{6}$

Multiple-Choice Questions

1. What is the value of $\sum_{k=1}^{4}(k+1)$?

   A. 8

   B. 10

   C. 12

   D. 14

2. Evaluate: $\sum_{n=1}^{5}(n^2-1)$

   A. 35

   B. 45

   C. 50

   D. 55

3. Which expression is equivalent to $\sum_{k=1}^{n} 5$?

   A. 5^n

   B. $5n$

   C. $n+5$

   D. $5(n-1)$

4. If $\sum_{i=1}^{n} i = 36$, what is the value of n?

   A. 7

   B. 8

   C. 9

   D. 6

5. What is the value of $\sum_{r=1}^{4}(2r-1)$?

   A. 10

   B. 12

   C. 14

D. 16