# Sigma Notation
## General Practice

QUESTIONS

1. Evaluate

(a) $\sum_{r=1}^{6} r$ (b) $\sum_{r=0}^{3} r^3$ (c) $\sum_{k=1}^{4} k^2$ (d) $\sum_{r=1}^{7} r+6$ (e) $\sum_{t=0}^{2} 9-t^2$ (f) $\sum_{r=1}^{9} 2r+7$

2. Express each of these sums using sigma notation

(a) $1^2+2^2+3^2+4^2$ (b) $1^1+2^2+3^3+4^4+5^5$ (c) $1+x+x^2+x^3+x^4$

(d) $1-x+x^2-x^3+x^4-x^5$ (e) $1-2+3-4+5-6$

ANSWERS

1. (a) 21 (b) 36 (c) 30 (d) 70 (e) 22 (f) 153

2. (a) $\sum_{k=1}^{4} k^2$ (b) $\sum_{k=1}^{5} k^k$ (c) $\sum_{k=0}^{4} x^k$ (d) $\sum_{k=0}^{5} (-x)^k$ (e) $\sum_{k=1}^{6} (-1)^{k+1} k$

QUESTION

1. Write each of the following series in full

(a) $\sum_{k=1}^{5} k^2$ (b) $\sum_{k=1}^{9} (2k-1)$ (c) $\sum_{k=1}^{10} \frac{2520}{k}$

2. Express each of the following series in the form $\sum_{k=1}^{n} f(k)$

(a) $1 + 2 + 3 + 4 + \ldots\ldots + 50$ (b) $5 + 10 + 15 + \ldots\ldots + 30$

(c) $3 + 5 + 7 + 9 + 11 + 13$

ANSWER

1. (a) $1^2+2^2+3^2+4^2+5^2$ (b) $1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17$

(c) $\frac{2520}{1}+\frac{2520}{2}+\frac{2520}{3}+\ldots\ldots+\frac{2520}{10}$

2. (a) $\sum_{1}^{50} k$ (b) $\sum_{1}^{6} 5k$ (c) $\sum_{1}^{6} 2k+1$