|  |  | TABLE 1 Set Identities. |  |
| :---: | :---: | :---: | :---: |
|  |  | Identity | Name |
|  |  | $\begin{aligned} & A \cap U=A \\ & A \cup \emptyset=A \end{aligned}$ | Identity laws |
|  |  | $\begin{aligned} & A \cup U=U \\ & A \cap \emptyset=\emptyset \end{aligned}$ | Domination laws |
| TABLE 2 Some Useful Summation Formulae. |  | $\begin{aligned} & A \cup A=A \\ & A \cap A=A \end{aligned}$ | Idempotent laws |
| Sum | Closed Form |  |  |
| $\sum^{n} a r^{k}(r \neq 0)$ | $\underline{a r^{n+1}-a}, r \neq 1$ | $\overline{(\bar{A})}=A$ | Complementation law |
| $\begin{gathered} C_{k=0} \\ \sum_{n}^{n} k \end{gathered}$ | $\begin{gathered} r-1 \\ n(n+1) \\ \hline \end{gathered}$ | $\begin{aligned} & A \cup B=B \cup A \\ & A \cap B=B \cap A \end{aligned}$ | Commutative laws |
| $\sum_{k=1} k$ | $\begin{aligned} & \frac{2}{n(n+1)(2 n+1)} \end{aligned}$ | $\begin{aligned} & A \cup(B \cup C)=(A \cup B) \cup C \\ & A \cap(B \cap C)=(A \cap B) \cap C \end{aligned}$ | Associative laws |
| $\sum_{k=1} k^{2}$ | $\frac{n(n+1)(2 n+1)}{6}$ | $\begin{aligned} & A \cup(B \cap C)=(A \cup B) \cap(A \cup C) \\ & A \cap(B \cup C)=(A \cap B) \cup(A \cap C) \end{aligned}$ | Distributive laws |
| $\sum_{k=1}^{n} k^{3}$ | $\frac{n^{2}(n+1)^{2}}{4}$ | $\begin{aligned} & \overline{A \cap B}=\bar{A} \cup \bar{B} \\ & \overline{A \cup B}=\bar{A} \cap \bar{B} \end{aligned}$ | De Morgan's laws |
| $\sum_{k=0}^{\infty} x^{k},\|x\|<1$ | $\frac{1}{1-x}$ | $\begin{aligned} & A \cup(A \cap B)=A \\ & A \cap(A \cup B)=A \end{aligned}$ | Absorption laws |
| $\sum_{k=1}^{\infty} k x^{k-1},\|x\|<1$ | $\frac{1}{(1-x)^{2}}$ | $\begin{aligned} & A \cup \bar{A}=U \\ & A \cap \bar{A}=\emptyset \end{aligned}$ | Complement laws |

