Find the node equation for the junction $A$.

A) $i_1 + i_2 + i_3 = 0$

B) $i_1 - i_2 + i_3 = 0$

C) $i_1 + i_2 - i_3 = 0$

D) $i_1 - i_2 - i_3 = 0$
For the junction $A$, the sum of the currents exiting minus the sum of the currents entering the junction is zero, $i_1 + i_2 + i_3 = 0$.

Convention 1: $\begin{array}{c} \text{Convention 1:} \\
\begin{array}{c}
A \quad \mathcal{E} \quad B \\
\end{array} \\
\Delta V = V_B - V_A = +\mathcal{E}
\end{array}$

Convention 2: $\begin{array}{c} \text{Convention 2:} \\
\begin{array}{c}
C \quad i \quad R \quad D \\
\end{array} \\
\Delta V = V_D - V_C = -iR
\end{array}$

Convention 3: Currents into a junction are positive and currents out of a junction are negative.

Answer A.

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