The electric field in a region is given by $\vec{E} = (Ax + B)\hat{i}$, where E is in NC^{-1} and x is in metres. The values of constants are A = 20 SI unit and B = 10 SI unit. If the potential at $x = 1$ is V_1 and that at $x = -5$ is V_2, then $V_1 - V_2$ is :

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(a) 320 V (b) −48V (c) 180 V (d) −520 V

(c) Given, $\overrightarrow{E} = (Ax + B)\hat{i}$

or $E = 20x + 10$

Using $V = \int E dx$, we have

$$V_2 - V_1 = \int_{-5}^{1} (20x + 10) dx = -180 \text{ V or } V_1 - V_2 = 180 \text{ V}$$