

Question: there is a net passage of $5.2 \cdot 10^{18}$ electrons by a point in a wire conductor in 0.22 s. What is the current in the wire?

Solution: the electric current is a flow of electrons in the wire. According to definition of the direct current, it is a quotient of the charge that passes through the wire and the time that it takes. So we can write

$$\text{Current} = \frac{\text{Total charge}}{\text{Time}}$$

The total charge $q = Ne$, where e is the charge of the electron. So we obtain

$$I = \frac{eN}{t} = \frac{5.2 \cdot 10^{18} \cdot 1.6 \cdot 10^{-19}}{0.22} \cong 3.78 \text{ A.}$$

Answer: $I \cong 3.78 \text{ A.}$