

1. A thin long wire A has twice the diameter and half the length of wire B. Both wires are made of the same material. (a) If the resistance of wire A equals R , find the resistance of Wire B; (b) compare the powers P_a/P_b if the two wires are connected to a battery in parallel; (c) find P_a/P_b if the two resistors (wires) are connected in series.

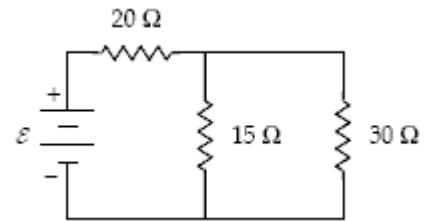
(a)

(b)

(c)

2. A wire has free electron density n_e of 8×10^{28} electrons per cubic meter and a cross-sectional area of 0.1 mm^2 . What is the drift velocity of the electrons when the current is 6.0 A ? ($e = 1.6 \times 10^{-19} \text{ C}$).

3. Consider a circuit with $\mathcal{E} = 9.0 \text{ V}$ and $R_1=20 \Omega$, $R_2=15 \Omega$, $R_3=30 \Omega$. (a) find the equivalent resistance; (b) find the power supplied by the battery; (c) find all currents and voltages on individual resistors.



4. The figure shows a network of resistors, all having the resistances $R=1 \text{ Ohm}$. Find the equivalent resistance, measured between points a and b.

