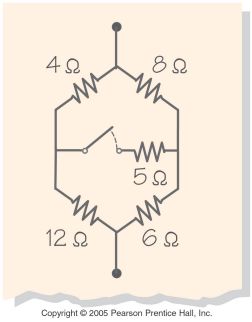
Inclass 3/22 – Circuit Practice Problems

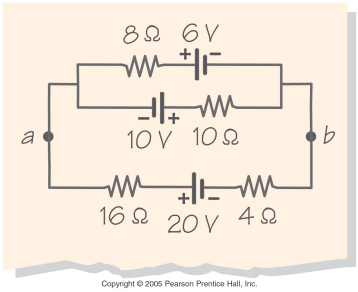
From Fishbane, Gasiorowicz, and Thornton

27.3. (I) A battery with an emf of 3.00 V sends a current of 1.99 A when it is connected in series with a 1.50-Ω resistor. What is the internal resistance of the battery?

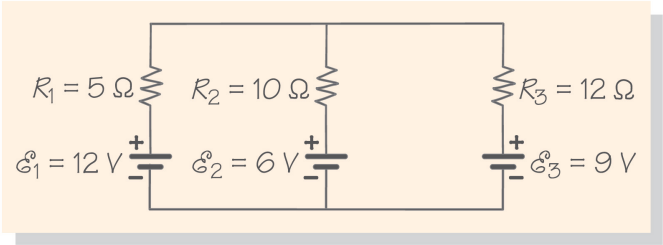
27.17. (II) Consider the part of a circuit shown in Fig. 27–28. What is the total resistance if (a) the switch is open, and (b) the switch is closed?
Hint: Even though there's no battery drawn, you can imagine one battery with potential difference, V, across the entire thing. Use that in two voltage loops to simplify the algebra a bit.



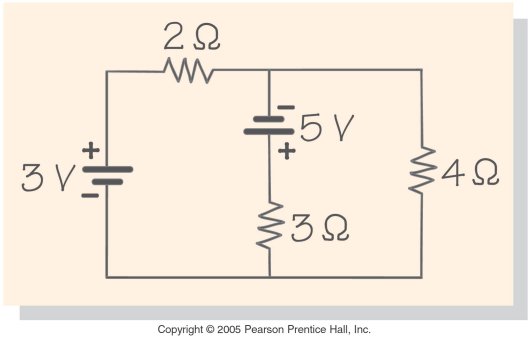
27.18. (II) Consider the circuit in Fig. 27–29. Calculate the current through the 16 Ω resistor, and the voltage across *ab*.



27.19. (II) Find the current that passes through each of the resistors in the circuit shown in Fig. 27–30.



27.20. (II) Find the current that passes through the $4\text{-}\Omega$ resistor in the circuit shown in Fig. 27–31.



27.21. (II) Three resistors connected in parallel have resistances of $250\ \Omega$, $420\ \Omega$, and $510\ \Omega$, respectively. The total current passing through the set is 0.020 A. What is the potential difference across the set, and what are the currents in each of the resistors?

27.22. (II) Can the resistors of the circuit in Fig. 27–32 be reduced to a single equivalent circuit by application of the rules for circuits with connections in parallel and in series? Solve for the currents through the three resistors.