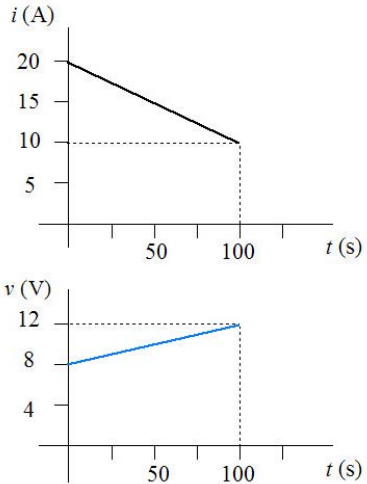
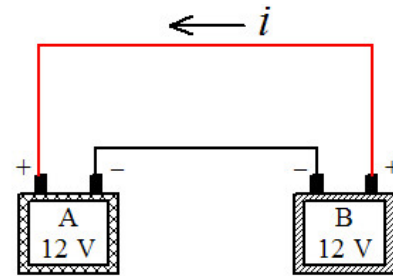


**ENGI1040 Electric Circuits Module: Tutorial ET1 (Basic Concepts) Fall 2009**

- (1) The voltage and current at the terminals of an automobile battery for a 100 second time interval during charging are shown below. Determine (a) the total charge transferred to the battery over the interval and (b) the equation which describes the power delivery to the battery.



- (2) Two 12-V car batteries are connected as shown below. Assume that the current  $i$  is measured and found to be  $-40$  A. (a) Which is the 'dead' battery? (b) If this connection is maintained for 1.5 minutes, how much energy is transferred to the dead battery?



- (3) Four 1.5 V dry cells are connected in series to provide a 100 mA current to a portable CD player. How much energy does this battery supply in 3 hours?

- (4) Two electric circuits are connected as shown below. The reference direction for the current  $i$  and the reference polarity for the voltage  $v$  across the interconnection are as shown. For each of the following measurements, calculate the power in the interconnection and state whether each of A and B are delivering or dissipating power: (a)  $i = 5$  A,  $v = 20$  V and (b)  $i = -15$  A,  $v = 100$  V.

