

PSC-4011 Quiz #1

Name: Shannon

Date:

A car's battery has a charge of 83 A·h. If the headlights of the car are left on overnight, for 7 and a half hours, and if the headlights draw a current of 11A, will the car start in the morning? Start-up requires a current of 500A for 3 seconds.

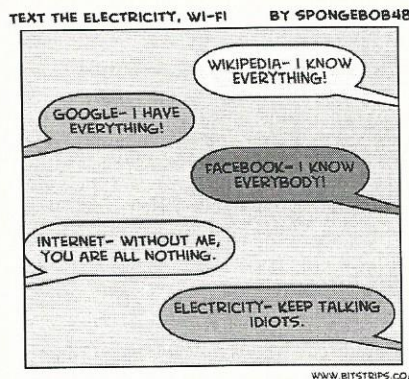
Note: All work must be shown and don't forget to answer the actual question!

$$Q_{\text{initial}} = 83 \text{ A}\cdot\text{h}$$

$$Q_{\text{used up}} = It = (7.5\text{h})(11\text{A}) \\ = 82.5 \text{ A}\cdot\text{h}$$

$$Q_{\text{left}} = Q_{\text{initial}} - Q_{\text{used up}} = 83 \text{ A}\cdot\text{h} - 82.5 \text{ A}\cdot\text{h} \\ = 0.5 \text{ A}\cdot\text{h}$$

$$Q_{\text{needed for start-up}} = It = (500\text{A})\left(\frac{3}{3600}\text{h}\right) = 0.417 \text{ A}\cdot\text{h}$$



Yes the car will start since

$$Q_{\text{left}} > Q_{\text{needed for start-up}}$$