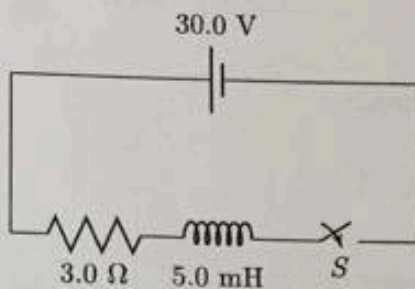


# Homework Quiz 4: Version B

Two Sides

1. A 30.0 volt battery, a 3.0 ohm resistor and a 5.0 millihenry inductor are connected in series to form a circuit as shown below.



- (a) A long time after the switch  $S$  is closed, when the current has reached its final steady-state value, how much energy is stored in the inductor?

$$U = \frac{1}{2} L i^2$$

$$i = V/R = 30/3 = 10 \text{ A}$$

$$U = \frac{1}{2} (5 \times 10^{-3}) (10)^2 = \boxed{0.25 \text{ J}}$$

- (b) What is the power being provided by the battery after this long time?

$$P = iV = 10 \text{ A} \cdot 30 \text{ V} = \boxed{300 \text{ W}}$$