

HOMEWORK 1

Due: [Tuesday, February 7](#)

Problems: 7.1, 7.4, and 7.7 (Griffiths , ED textbook)

Problem 1

A circular loop of wire with radius a and electrical resistance R lies in the x-y plane. An uniform time-dependent magnetic field $\mathbf{B}(t)$, turned on at time $t=0$, is given by formula: $\mathbf{B}(t) = B_0 \frac{\hat{e}_y + \hat{e}_z}{\sqrt{2}} [1 - e^{-\mu t}]$, where B_0 and μ are positive constants.

Determine:

- (a) the current $I(t)$ induced in the loop;
- (b) the energy $W(t)$ converted to Joule's heat as a function of time t .