

### Question 1

The characteristic curves of two nonlinear inductors are shown in Fig. 1, where each inductor and its corresponding characteristic curve have the same color. Let the initial magnetic fluxes be  $\phi_1(0) = \Phi_1 = 0$  and  $\phi_2(0) = \Phi_2 = -6$ .

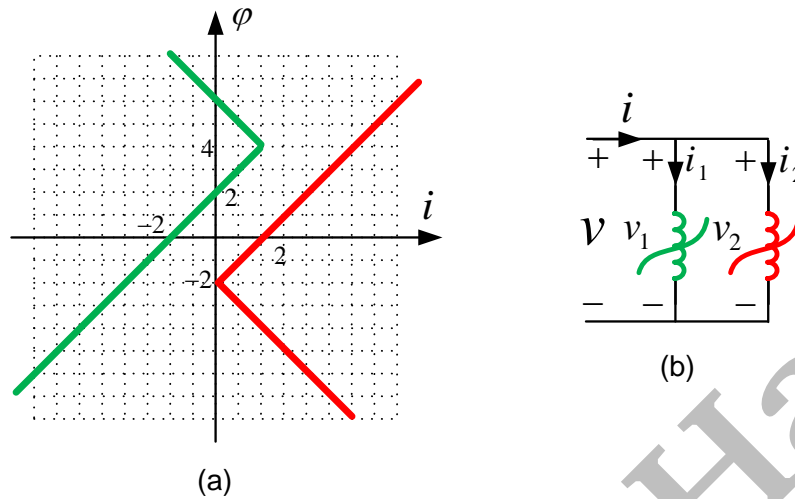


Figure 1: Two NTI inductors (a) their characteristic curves (b) their parallel connection.

(a) Find an expression for the characteristic curve of the parallel connection of the two inductors.

(b) Find an expression for the current signal  $i(t)$  if  $v(t) = \sin(t)$ .