An inductor is in series with two voltage sources. Source V_{SC} is constant with a value of 10 V. Source V_{SQ} switches back and forth between 20 V and 0 V, with a period of 20 μs, as shown below Make a quantitative sketch the corresponding inductor current. Assume that the inductor current $i_L = 2$ A at $t = 0$. (You may want to start by making a sketch of the inductor voltage as a function of time.) Be sure to show any calculations used in making the current plot.

i_L L_1 25 μH

$+ \; v_L \; -$

V_{SQ} $+ \atop -$

V_{SC}
10 V

$V_{SQ}(t)$

20 V

0

10   20   30   40   50

$t\,(\mu s)$

$i_L(t)$

0

10   20   30   40   50

$t\,(\mu s)$

Write your answers — and whatever work will fit — on this sheet. Staple any sheets with additional work behind.