A time-varying current source is connected to a 100-µH inductor. The source has the following time-dependence:
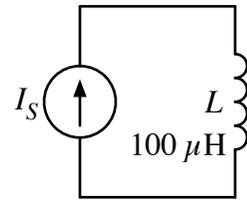
For $0 < t \le 25$ µs, the current increases linearly:

$$I_S(t) = \left(2 \times 10^5 \,\text{A/s}\right) \cdot t$$

For 25 µs $< t \le 100$ µs, the current decreases linearly:

$$I_S(t) = 5\,\text{A} - \left(6.67 \times 10^4 \,\text{A/s}\right)\left(t - 25\,\mu\text{s}\right)$$

For 100 µs $< t \le 150$ µs, the current increases parabolically:

$$I_S(t) = 5\,\text{A} - \left(2 \times 10^9 \,\text{A/s}^2\right)\left(t - 150\,\mu\text{s}\right)^2$$

For 150 µs $< t \le 200$ µs, the current decreases parabolically:

$$I_S(t) = \left(2 \times 10^9 \,\text{A/s}^2\right)\left(t - 200\,\mu\text{s}\right)^2$$

I_S L $100\,\mu\text{H}$

IS (V)

time (µs)

$v_L(t)$

t