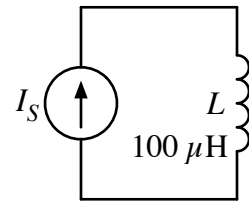A time-varying current source is connected to a 100-μH inductor. The source has the following time-dependence:

For $0 < t \leq 25$ μs, the current increases linearly:

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

For 25 μs $< t \leq 100$ 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 $< t \leq 150$ 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 $< t \leq 200$ μs, the current decreases parabolically:

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

$v_L(t)$

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