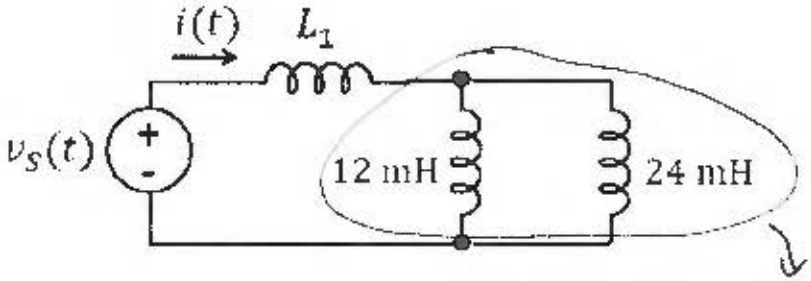
Find the current i (i.e., the constant B).

(For this problem, ignore the initial conditions. As we will see later in this course, this means we assume the system is in what is called "steady state".)

A = 4.8 V

L1 = 4 mH

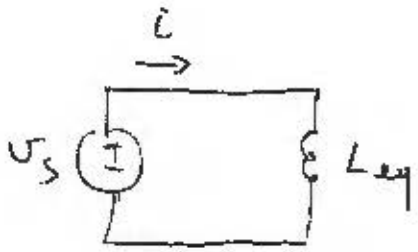


$$v_S(t) = \mathrm{A} \cdot \cos(2000t)$$

$$i(t) = \mathrm{B} \cdot \sin(2000t)$$

PARALLEL

$$\frac{1}{\frac{1}{12} + \frac{1}{24}} = \frac{1}{\frac{3}{24}} = 8 \text{ mH}$$



$$L_{eq} = L_1 + 8 = 12 \text{ mH}$$

$$v = L \frac{di}{dt} \Rightarrow 4.8 \cos(2000t) = L_{eq} \cdot B \, 2000 \cos(2000t)$$

$$\Rightarrow B = \frac{4.8}{2000 \cdot 12 \cdot 10^{-3}} = \frac{4.8}{24} = 0.2 \text{ A}$$

$$\boxed{B = 200 \text{ mA}}$$