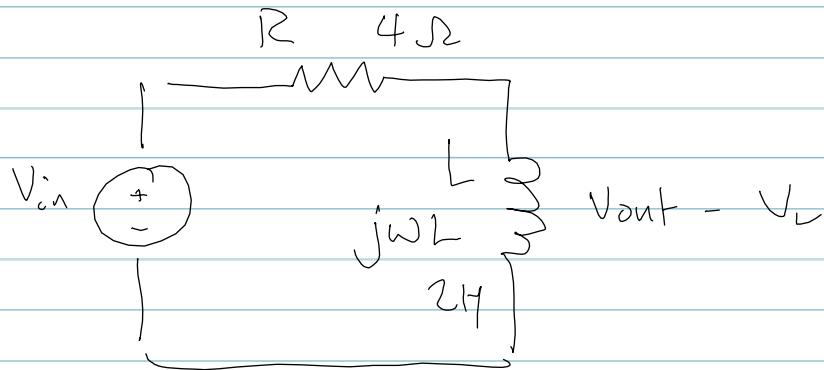


Example 2



$$V_{out}(\omega) = \frac{j\omega}{4 + j\omega} V_{in}(\omega)$$

$$= \frac{j\omega}{j^2\omega + 1} \frac{j\omega}{j\omega + 2}$$

$$H(\omega) = \frac{V_{out}}{V_{in}} = \frac{j\omega}{j^2\omega + 1} \frac{j\omega}{j\omega + 2}$$

$$V_{in}(t) = 5e^{-3t} \text{ volt}$$

$$V_{in}(\omega) \leftrightarrow \frac{5}{j\omega + 3}$$

$$V_{out}(\omega) = \frac{j\omega}{j\omega + 2} \cdot \frac{5}{j\omega + 3} = \frac{r_1}{j\omega + 2} + \frac{r_2}{j\omega + 3}$$

$$r_1 = -10 \quad r_2 = +15$$

$$V_{out}(\omega) = \frac{15}{j\omega + 3} - \frac{10}{j\omega + 2}$$

To hear and view this Pencast PDF on your computer,
[click here](#) to get the latest version of Adobe® Reader®.

$$V_L(t) = V_{out}(t) = \mathcal{F}^{-1} \left\{ \frac{15}{j\omega + 3} - \frac{10}{j\omega + 2} \right\}$$

$$= 15e^{-3t} u_0(t) - 10e^{-2t} u_0(t)$$
$$= \underline{\left[15e^{-3t} - 10e^{-2t} \right]} u_0(t).$$