Tutorial 2

Problem 1

19. Find the transfer function, $G(s) = V_o(s)/\ V_i(s)$, for each network shown in Figure P2.5. Solve the problem using mesh analysis. [Section: 2.4]

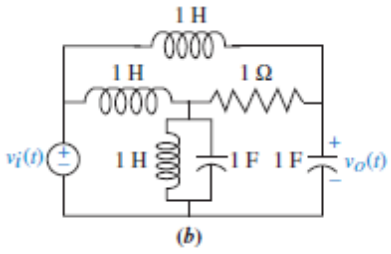

FIGURE P2.5

Problem 2

20. Repeat Problem 19 using nodal equations. [Section: 2.4]

Problem 3

53. Consider the differential equation

$$\frac{d^2x}{dt^2} + 3\frac{dx}{dt} + 2x = f(x)$$

where $f(x)$ is the input and is a function of the output, x. If $f(x) = \sin x$, linearize the differential equation for small excursions. [Section: 2.10]

a. $x = 0$

b. $x = \pi$

Problem 4

54. Consider the differential equation

$$\frac{d^3x}{dt^3} + 10\frac{d^2x}{dt^2} + 20\frac{dx}{dt} + 15x = f(x)$$

where $f(x)$ is the input and is a function of the output, x. If $f(x) = 3e^{-5x}$, linearize the differential equation for x near 0. [Section: 2.10]