MATH 3331 HOMEWORK DUE MARCH 21

PROFESSOR WAGNER

(1) Solve the initial value problem:

$$x''(t) + 2x'(t) + 10x(t) = 2\cos(2t), \qquad x(0) = 0, \quad x'(0) = 0.$$

Identify the transient and steady state.

(2) Find all positive values of ω for which the forced spring with equation

$$x'' + 16x = \sin(\omega t)$$

is resonant.

(3) Find the Laplace transform of the piecewise defined function:

$$f(t) = \begin{cases} t, &) \leq t < 1 \\ e^{2t}, 1 \leq t < \infty \end{cases}$$

(4) Find $f(t)$, if $\mathcal{L}(f(t))(s) = F(s) = \frac{3}{s^2+2s+5}$

(5) Find $f(t)$, if $\mathcal{L}(f(t))(s) = F(s) = \frac{5s^2-11s+14}{(s-3)(s^2+4)}$.

Date: March 9, 2018.