

Section 3.6 of your text uses the following notation. We are considering the following equation

$$mx'' + cx' + kx = F(t) \quad (1)$$

where $F(t) = A \cos(\beta t)$. When looking for a solution, we find a particular solution $x_p(t)$ of the form

$$x_p(t) = d_1 \cos(\beta t) + d_2 \sin(\beta t).$$

or equivalently,

$$x_p(t) = C \cos(\beta t - \phi).$$

Your book calls this the steady-periodic solution x_{sp} . The solution of the associated homogeneous equation

$$mx'' + cx' + kx = 0$$

is called in your text the transient solution x_{tr} . It is called transient because if $c > 0$, then the solution will decay to zero as $t \rightarrow \infty$. The solution of equation (1) is the sum of a steady periodic solution x_{sp} and a transient solution x_{tr} .

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1. Section 3.4; 15, 17, 18. Use Octave to produce your graphs.
 2. Section 3.6: 4
 3. Section 3.6: 7, 8. For the graphs, make a graph of both the steady periodic function and the following adjusted forcing term: $F_1(x) = F(x)/m$. That is, ignore the ω in the book's version of the adjusted forcing term. Use Octave to produce your graphs.
 4. Section 3.6: 11, 12. For the graphs, ignore the text's instructions. Instead, use Octave to plot the following:
 - a) The full solution $x(t)$ and the steady periodic solution $x_{sp}(t)$ on the same graph.
 - b) On a separate graph, the transient solution $x_{tr}(t)$.