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/m333.sp07/handouts333/Driven2OLDECC_probs/ProbsDriven304

These are alleged answers. For each error herein, you get extra-credit points for being the first to report it by e-mail.

1 $y'' + 4y = -36 \sin(4t)$ with $y(\pi) = 1$ and $y'(\pi) = 0$.

First-try Answer

$$y(t) = 3 \sin(4t) + \cos(2t) - 6 \sin(2t)$$

2 $y'' + 4y = 16t^3 - 36 \sin(4t)$ with $y(0) = 2$ and $y'(0) = 14$.

Second-try Answer

$$y(t) = 4t^3 - 6t + 3 \sin(4t) + 2 \cos(2t) + 4 \sin(2t)$$

3 $y'' - y = \text{Step}(t, \ln(2))$ with $y(0) = 0$ and $y'(0) = 1$.

First-try Answer

$$y(t) = \begin{cases} \frac{1}{2}e^t - \frac{1}{2}e^{-t} & \text{if } 0 \leq t \leq \ln(2) \\ -1 + \frac{3}{4}e^t + \frac{1}{2}e^{-t} & \text{if } t > \ln(2) \end{cases}$$

OR

$$y(t) = \begin{cases} \sinh(t) & \text{if } 0 \leq t \leq \ln(2) \\ -1 + \frac{1}{4}e^t + \cosh(t) & \text{if } t > \ln(2) \end{cases}$$

4 $y'' + 4y' + 4y = e^{3t}$ with $y(1) = 2$ and $y'(1) = 0$.

Third-try Answer

$$\begin{aligned} y(t) &= \frac{e^{3t}}{25} + e^{-2t} \left[\left(\frac{20e^2 - e^5}{5} \right) t + \left(\frac{-50e^2 + 4e^5}{25} \right) \right] \\ &= \frac{1}{25} \{ e^{3t} + e^{-2t} [(100e^2 - 5e^5)t + (-50e^2 + 4e^5)] \} \end{aligned}$$