Quiz 4, Math 246, Professor David Levermore
Thursday, 1 October 2020

This formative assessment helps you see how well you understand the material. To get an accurate assessment please do not use books, notes, or electronic aids. Show your reasoning for full credit. Good luck!

(1) [3] Determine the interval of definition for the solution to the initial-value problem

$$y''' - 6t\,y'' + \frac{e^t}{6-t}\,y' - \frac{3}{\sin(t)}\,y = \frac{\cos(2t)}{5+t}\,, \qquad y(4) = y'(4) = y''(4) = -3\,.$$

(2) [3] Let $U_1(t) = \cos(3t)$ and $U_2(t) = \sin(3t)$. Compute their Wronskian $\mathrm{Wr}[U_1, U_2](t)$. (Evaluate the determinant and simplify.)

(3) [4] Given that $\cos(3t)$ and $\sin(3t)$ are solutions of $u'' + 9u = 0$, solve the general initial-value problem associated with $t = 0$ — namely, solve

$$u'' + 9u = 0\,, \qquad u(0) = u_0\,, \quad u'(0) = u_1\,.$$