

**Quiz 4, Math 246, Professor David Levermore**  
**Tuesday, 2 October 2018**

**Your Name:**

**Discussion Instructor (circle one):**            Sid Sharma            Anqi Ye  
**Discussion Time (circle one):**            8:00            9:00            10:00

**No books, notes, calculators, or any electronic devices.**  
**Show your reasoning for full credit. Good luck!**

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

$$u''' + \frac{1}{2-t} u'' - \frac{e^t}{\sin(t)} u = \frac{\cos(2t)}{8+t}, \quad u(-7) = u'(-7) = u''(-7) = 3.$$

- (2) [3] Compute the Wronskian  $\text{Wr}[V_1, V_2](t)$  of the functions  $V_1(t) = e^{3t}$  and  $V_2(t) = t e^{3t}$ .  
(Evaluate the determinant and simplify.)

- (3) [4] Given that  $e^{3t}$  and  $t e^{3t}$  are linearly independent solutions of  $v'' - 6v' + 9v = 0$ , solve the general initial-value problem associated with  $t = 0$  — namely, solve

$$v'' - 6v' + 9v = 0, \quad v(0) = v_0, \quad v'(0) = v_1.$$