

Name \_\_\_\_\_

Score \_\_\_\_\_

Answer the problems on separate paper. You do not need to rewrite the problem statements on your answer sheets. Work carefully. Do your own work. **Show all relevant supporting steps!** Attach this sheet to the front of your answers.

1. (8 pts) Find the general solution of the differential equation  $y'' - 16y' + 12y = 0$
2. (8 pts) Find the general solution of the differential equation  $y'' + 12y' + 38y = 0$
3. (12 pts) Solve the initial-value problem  $y'' - 4y' - 32y = 0$ ,  $y(0) = -4$ ,  $y'(0) = 6$
4. (12 pts) Find the general solution of the differential equation  $y'' - y' - 12y = -4 + 12x^2$
5. (12 pts) Find the general solution of the differential equation  $y'' - y' - 12y = x + 2e^{4x}$
6. (8 pts) Find the general solution of the differential equation  $x^2 y'' - 9xy' + 16y = 0$
7. (8 pts) Find the general solution of the differential equation  $x^2 y'' + 9xy' + 24y = 0$
8. (12 pts) Solve the initial-value problem  $x^2 y'' - 3xy' - 12y = 0$ ,  $y(1) = -2$ ,  $y'(1) = 6$
9. (6 pts) Use the method of *Variation of Parameters* to find a particular solution of  $x^2 y'' + 6xy' + 6y = \ln 6x$
10. (6 pts) Other "A" Problem
11. (8 pts) Other "B" Problem
12. (8 pts) Other "C" Problem