
EXAM

Practice Questions for Exam #2

Math 3350, Spring 2004

April 3, 2004

- Write all of your answers on separate sheets of paper. You can keep the exam questions when you leave. You may leave when finished.
- You **must** show enough work to justify your answers. Unless otherwise instructed, give exact answers, not approximations (e.g., $\sqrt{2}$, not 1.414).
- You may use the book, your notes, and the handouts given in class
- This exam has 5 problems.

Good luck!

Problem 1. Find the general solution.

A. $D^3(D-2)(D-3)^2y = 0$.

B. $(D-1)(D-2)(D^2-4D+13)^2y = 0$.

Problem 2. Find the general solution by the method of undetermined coefficients.

A. $(D^2-2D+1)y = x^2+3x+1$.

B. $(D^3+2D^2)y = x$.

C. $(D^2-2D+1)y = e^{2x}$.

D. $(D^2-3D+2)y = x^2e^{2x}$.

E. $(D^2-3D+2)y = x^2\sin(2x)$.

F. $(D^2-4D+5)y = e^{2x}\cos(x)$.

Problem 3. Find the general solution by the method of variation of parameters..

A. $y''+4y = \tan(2x)$.

B. $x^2y''-4xy'+6y = x$ (Be sure to express the equation in standard form before setting up variation of parameters.)

Problem 4. In each part, find the inverse Laplace transform of the given function.

A. In this part, find the partial fractions decomposition **by hand**.

$$\frac{4}{s^2(s-2)^2}$$

B. In this part, you can find the partial fractions decomposition with the calculator, if you wish.

$$\frac{2s^2-3s+6}{(s-2)(s^2+4)}$$

Problem 5. In each part, find the solution of the initial value problem by the method of laplace transforms.

A. $y'' - 6y' + 9y = t$, $y(0) = 1$, $y'(0) = 0$.

B. $y'' - 6y' + 9y = e^{3x}$, $y(0) = 0$, $y'(0) = 1$.
