March 23, 2010 **MATH 351, Spring 2010** Prof. V. Panferov

Homework Assignment 5

Due Thu. Mar. 25, 2010, in class.

1. Problems 1, 5, 6, 11, 14, 15, 17 (a), (d), (e) in Section 3.4 (pp. 115-117).

2. Problems 1 (d), (e); 5, Section 3.6, pp. 126–127.

3. Problems 9, 12, Section 3.7, pp. 129–131.

4. Functions $v_1(t) = t$, $v_2(t) = t^5$, $v_3(t) = |t^5|$ satisfy the equation $t^2u'' - 5tu' + 5u = 0$. Are they linearly independent on the interval $(-1, 1)$? Explain that there is no contradiction with the fact that the general solution of a second order equation has the form $u(t) = c_1u_1(t) + c_2u_2(t)$.

5. Show that two solutions of the equation $u'' + p(t)u' + q(t)u = 0$ (the coefficients $p(t)$ and $q(t)$ are continuous functions) that achieve a maximum at the same value of t have to be linearly dependent.

6. Knowing three particular solutions $u_1(t) = 1$, $u_2(t) = t$, $u_3(t) = t^2$ of a linear nonhomogeneous equation of second order, find its general solution.