Math 242, 1993, Exam 2

There are 7 problems. Problems 1 – 5 are worth 14 points each. Problems 6 and 7 are worth 15 points each. Use your own paper. SHOW your work. $\boxed{CIRCLE}$ your answer. CHECK your answers.

1. Solve $y'' - 3y' + 2y = 0$.

2. Solve $y'' - 2y' + y = 0$.

3. Solve $y'' - 4y' + 13y = 0$.

4. Solve $y' = y + y^3$.

5. Solve $xy' = y + 2\sqrt{xy}$.

6. State the Existence and Uniqueness Theorem about linear differential equations of high order.

7. The differential equation $mx'' + cx' + kx = 0$ describes the motion of a damped spring acting with out external forces. Suppose that $m = 2$, $c = 12$, $k = 50$, $x(0) = 0$, and $x'(0) = -8$.
   (a) Find $x(t)$.
   (b) Graph $x(t)$.