

Math 324
Final Review (Comprehensive)
Spring 2008

Name: _____

Date: _____

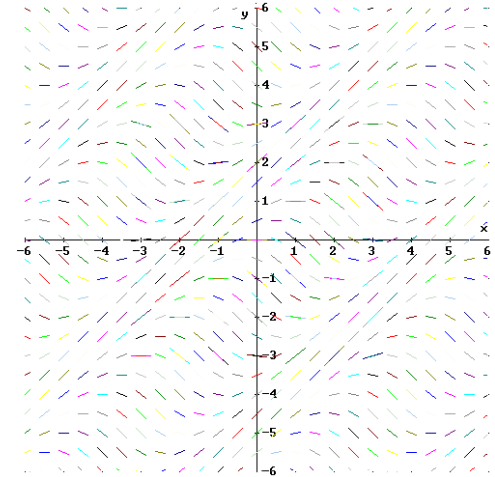
This review sheet is worth ten points. It is due on Friday, May 2. **The final is May 2 at 10:15 AM in KC 100**

1. Sketch an approximate solution curve that passes through the indicated points.

a. $y(-3) = 2$

b. $y(2) = 1$

2. Solve the exact equation $\left(1 + \ln x + \frac{y}{x}\right) dx = (1 - \ln x) dy$.



3. Solve the IVP.

a. $x'' + 4x' + 5x = \delta(t - \pi) + \delta(t - 2\pi)$, $x(0) = 0$ and $x'(0) = 2$.

b. $y'' - 2y' + 2y = e^{-t}$, $y(0) = 0$ and $y'(0) = 1$.

c. $y'' + 4y = f(t)$, where $f(t) = \begin{cases} \sin t & 0 \leq t < \pi \\ 2 \sin t & t \geq \pi, \end{cases}$ $y(0) = 0$ and $y'(0) = 0$.

4. Find a general solution of the ODE.

a. $y''' + 7y'' + 10y' = 0$

b. $3y'' + 2y' + 2y = 0$

c. $y'' + 16y = \sin 4x$

d. $y'' + 9y = 9 \sec^2 3x$, where $0 < x < \pi/6$

5. Solve the system $x' = x + 2y$, $y' = x + e^{-t}$ for the initial values $x(0) = 0$ and $y(0) = 0$.