

MATH 361 Exam 1, Spring 2012

	Name:
1.	<p>Solve the equation: $ty' + 2y = \sin t, \quad y(\pi/2) = 1$</p> <p style="text-align: right;">Ans: _____.</p>
2.	<p>Solve the equation: $y' = 2x/(y + x^2y), \quad y(0) = -2$</p> <p style="text-align: right;">Ans: _____.</p>
3.	<p>Solve the equation: $(\cos x + \ln y + 4)dx + \left(\frac{x}{y} + e^y\right) dy = 0$</p> <p style="text-align: right;">Ans: _____.</p>
	<p><u>Extra space</u></p>

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4. Sketch the solutions of $y' = y^2(y - 9)$, satisfying each of the initial conditions: a) $y(0) = 2$, $y(0) = 5$ and $y(0) = -3$. Classify the equilibrium solutions as asymptotically stable, unstable or semistable. (Write a short sentence of explanation!)

5. A tank originally contains 200 gal of fresh water. Water containing $1/2$ lb of salt per gallon is poured into the tank at a rate of 8 gal/min and the mixture is allowed to leave at the same rate. Find the amount of salt in the tank after 10 min.

Ans: _____.

Extra space