

MATH 361 Exam 1, Fall 2011

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

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4. Sketch the solutions of $y' = y^3 - 16y$, satisfying each of the initial conditions:

a) $y(0) = 1$, $y(0) = 3$ and $y(0) = -1$.

b) Classify the equilibrium solutions $y = 0$ and $y = 4$ as asymptotically stable, unstable or semistable.

5. A tank originally contains 100 gal of fresh water. Water containing $1/8$ lb of salt per gallon is poured into the tank at a rate of 4 gal/min and the mixture is allowed to leave at the same rate. Find the amount of salt in the tank after 25 min.

Ans:_____.

Extra space