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Math 211
Lecture 2

Fall 03/04
G.Meyer

Final

Your Name: _____

Your TA: _____

Problem	Points	Score
1	6	
2	6	
3	6	
4	6	
5	6	
6	6	
7	6	
8	6	
9	6	
10	6	
Total	60	

1. Solve the following initial value problem: $\frac{dy}{dx} = \frac{x+1}{y}$ and $y(2) = 4$.

2. Draw the level curves of the function $f(x, y) = y/x^2$ with heights $z = -1, 0, 1$ and 4 .

3. Find the equation of the tangent plane to the graph of the function $f(x, y) = -xy$ at the point $(1, -1)$.

4. Find all the critical points of the function $f(x, y) = 2x^2 + 3xy + 6y$.

5. Find the maximum value of $f(x, y) = 6x - 8y$ subject to the constraint $3x^2 + 4y^2 = 7$.

6. In a right triangle the hypotenuse has length 6 and one of the shorter sides has length 3.
- (a) Find the length of the third side.
 - (b) Find the other two interior angles of this triangle.
 - (c) Find \sin , \cos , and \tan of the smallest of the angles.

7. Find the points where the function $f(x) = x - \sin(2x)$ achieves a global maximum and minimum on the interval $[0, 2\pi]$.

8. Find the indefinite integral $\int \sin(3x)\cos(3x)dx$.

9. Find the area under the graph of $y = \tan x$ from zero to $\pi/3$.

10. Find the equilibrium solutions of the given differential equation and determine if they are asymptotically stable: $\frac{dy}{dx} = 0.1(10y - 16 - y^2)$

