

UNIVERSITY OF REGINA  
DEPARTMENT OF MATHEMATICS AND STATISTICS  
MATH 281 200610 Quiz 2  
Edward Doolittle

Time: 30 minutes

Instructor: Dr. Edward Doolittle

Name: \_\_\_\_\_

Student #: \_\_\_\_\_

(marks) Please do questions 1 and 2. You have 10 minutes to do each question, and 10 minutes to check your work, for a total of 30 minutes for the quiz. A non-programmable calculator is allowed but is not necessary. If you finish early, I recommend you try question 3.

(10) 1. Solve the initial value problem

$$\frac{dy}{dx} = \frac{y^2 - 1}{x^2 - 1}, \quad y(2) = 2.$$

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- (10) 2. Solve the differential equation

$$2x \sin^2 y \, dx - (x^2 + 10) \cos y \, dy = 0.$$

Are there any lost solutions? If so, write them down. You may find the formula

$$\frac{d}{dx} \csc x = -\cot x \csc x$$

useful.

- (0) 3. *To amuse yourself if you finish early.* Solve the autonomous differential equation  $y' = y - y^3$  using partial fractions.