

UNIVERSITY OF REGINA
DEPARTMENT OF MATHEMATICS AND STATISTICS
MATH 281 200610 Quiz 4

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 $(x^2 + 1)y'' + 2xy' = 0$, $y(0) = 0$, $y'(0) = 1$ using power series.

- (10) 2. Find the Laplace transform of the function $f(t)$ with the graph depicted in Figure 1.

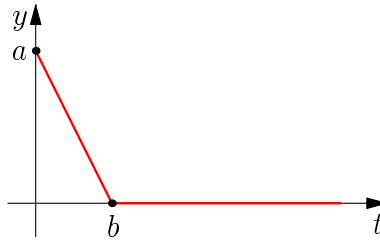


Figure 1: Graph of $f(t)$

- (0) 3. *To amuse yourself if you finish early.* Solve the equation $(x^2 + 1)y'' + 2xy' = 0$ in two different ways. What is the radius of convergence of a solution? Show every point is an ordinary point for the equation. Why then is the radius of convergence of a solution not ∞ ?