

# Examination Booklet

## MATH 2420: Differential Equations and Applications

### Exam I (Sample)

Last Name: \_\_\_\_\_  
(print)

First Name: \_\_\_\_\_  
(print)

Signature: \_\_\_\_\_

**Read all of the following information before starting the exam:**

- There are **four** problems in this exam.
- Show the significant steps of your work clearly for all problems.
- Circle or otherwise indicate your final answers.
- If you need to visit the restroom, bring your paper to the proctor.
- You may not leave the exam until 30 minutes have elapsed.
- Good luck!

**For Instructor's Use Only**

Question	Weight	Your score
1	10	
2	10	
3	10	
4	10	
<b>Total</b>		

1. Solve the following initial value problem

$$\begin{cases} \frac{dy}{dx} = \frac{2y - x + 5}{2x - y - 4}, \\ y(1) = 1. \end{cases}$$

2. Solve the following initial value problem

$$\begin{cases} 3xy' - 3x(\ln x)y^4 - y = 0, & x > 0, \\ y(1) = 1. \end{cases}$$

3. Solve the following differential equation

$$(7xy^3 + y - 5x)y' + y^4 - 5y = 0.$$

4. Solve the following initial value problem

$$\begin{cases} (xy' - y) \cos\left(\frac{y}{x}\right) + x = 0, \\ y(1) = \frac{\pi}{2}. \end{cases}$$

**The end**