

# MATH 3191 Written Homework 8

\_\_\_\_/20 points

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

Due: March 9<sup>th</sup>

Show all work that leads to your answers. I will be providing feedback on the work as well as the answers!

1. Using  $\mathcal{B}, \mathcal{C}$  as defined below, answer the following questions

$$\mathcal{B} = \{t^2, 1+t, 1-t\}, \mathcal{C} = \{1+t+t^2, 1, t^2\}$$

- (a) (10 points) Demonstrate that  $\mathcal{B}$  and  $\mathcal{C}$  are each a basis for  $\mathcal{P}_2(\mathbb{R})$  (The set of all polynomials with real coefficients of degree at most 2).
- (b) (10 points) Write the change of basis matrix given by  ${}_{\mathcal{C} \leftarrow \mathcal{B}}P$ .