Exercise 02

Please attempt all of the following problems before the due date. Your grade on this assignment will be calculated from the best two answers.

Problem 02.1

Consider an object whose position vector $\vec{r}$ changes by the displacement vector $\vec{d} = \Delta \vec{r}$ and is acted on by a constant force $\vec{F}$.

Let $V$ be the set of possible displacement vectors and show that the work done by the force $\vec{F}$ is a linear form over the vector space $V$.

Answer 02.1

Put all of your calculations here. When you have completed all of the problems, wrap the resulting file and e-mail it to me at rgowdy@saturn.vcu.edu.

Problem 02.2

Consider the differential form $\alpha = 4dx - 2dy$ in $\mathcal{T}(0,0)$ and the directional derivative $v = 3\partial_x + 2\partial_y$ and calculate the number $\alpha (v)$ that $\alpha$ assigns to $v$.

Answer 02.2

Put all of your calculations here. When you have completed all of the problems, wrap the resulting file and e-mail it to me at rgowdy@saturn.vcu.edu.

Problem 02.3

Show that $\hat{\mathfrak{R}}$ is isomorphic to $\mathfrak{R}$.

Answer 02.3

Put all of your calculations here. When you have completed all of the problems, wrap the resulting file and e-mail it to me at rgowdy@saturn.vcu.edu.