

Homework Set 3

DUE: SEP 23, 2019 (AT THE BEGINNING OF CLASS)

To be handed in:*Please write your solution to Problems 1 and 2 on a single sheet of paper!*1. Consider the vector-valued function $\vec{r}(t) = (t^3+1, e^{-t}, 2t^2)$. Compute the following:

- a) $\vec{r}(t)$
- b) $\vec{r}'(t)$
- c) $\vec{r}''(t)$
- d) $\langle \vec{r}(t), \vec{r}'(t) \rangle$
- e) $\langle \vec{r}'(t), \vec{r}''(t) \rangle$

2. Compute the following definite integral of a vector-valued function:

$$\int_0^1 te^t \mathbf{i} - \sin t \mathbf{j} + \frac{1}{1+t^2} \mathbf{k} dt$$

NOT to be handed in (but recommended for you to practice with):

3. Textbook (5th edition) Section 11.7, Exercises 1-4, 7-10, 13-16, 21-24, 89-94
4. Textbook (5th edition) Section 12.1, Exercises 1-4, 13-14, 21-24
5. Textbook (5th edition) Section 12.2, Exercises 1-4, 16-20, 53-55, 61, 65