

Assignment 4 (10/5)

Subhadip Chowdhury

Problem 1

Problems 2.6.(10, 25, 27, 32).

Problem 2

Problems from Review Exercise at the end of chapter 2. Problems 41, 49, 50.

Problem 3

Problems 3.1.(42, 52, 59).

Problem 4

Let a function $f : \mathbb{R} \rightarrow \mathbb{R}$ satisfy the equation

$$f(x + y) = f(x) + f(y)$$

for all $x, y \in \mathbb{R}$. Prove that

1. if f is continuous at $x = 0$, then it is continuous for all $x \in \mathbb{R}$.
2. If f is differentiable everywhere then $f(x) = xf(1)$ for all $x \in \mathbb{R}$.

Problem 5

A cone of radius 2 cm and height 5 cm is lowered point first into a tall cylinder of radius 7 cm that is partially filled with water. Determine how fast the depth of the water is changing at the moment when the cone is completely submerged if the cone is moving with a speed of 3 cm/s at that moment.

Problem 6

At noon, ship A is 20 km west of ship B . Ship A is sailing east at 4 km/h and ship B is sailing north at 3 km/h . How fast is the distance between the ships changing at 4 : 00 PM?