

MATH 267 (Section E1) Homework No. 2

Reading

Section 2.4,

Section 2.5 (up to Example 1 included)

Section 2.6

Section 2.7

Suggested Problems

Section 2.4: Exercise 1,2,3,7,9

Section 2.6: Exercises 1, 4, 11, 13, 19

Section 2.7: Exercise 1,3

Problems to be handed in in class on Thursday January 25

Problem 1 Consider the boundary value problem

$$y' = \frac{t}{\sqrt{1-ty}}$$
$$y(0) = 1.$$

Find a box in the (t, y) -plane containing a curve which is solution of the above B.V.P. Justify your answer.

Problem 2 Show that the following differential equation is exact

$$xy^2 + \sin(y) + (x^2y + \cos(y)x)y' = 0.$$

Find in implicit form the function satisfying this differential equation and the boundary condition

$$y(1) = \pi.$$

Problem 3 Consider the B.V.P.

$$y' = y^2 + t,$$

$$y(0) = 1.$$

Apply Euler method with step $h = 0.1$ to find approximations of $y(0.1)$, $y(0.2)$ and $y(0.3)$.