

Chapter 1

First

1.1 EXERCISES

1. In problem i.-iii., determine whether the given differential equation is separable

i. $\frac{dy}{dx} - \sin(x + y) = 0$

ii. $\frac{dy}{dx} = 4y^2 - 3y + 1$

iii. $\frac{ds}{dt} = t \ln(s^{2t}) + 8t^2$

2. In problem iv.-vii., solve the equation

iv. $\frac{dx}{dt} = 3xt^2$

v. $y^{-1}dy + ye^{\cos x} \sin x dx = 0$

vi. $(x + xy^2)dx + ye^{\cos x} \sin x dx = 0$

vii. $\frac{dy}{dt} = \frac{y}{t+1} + 4t^2 + 4t, \quad y(1) = 10$

1.2 EXERCISES

Another exercise.

1. If you don't need a horizontal list, you can simply use `\Question`

Chapter 2

Second

2.1 EXERCISES

1. Eight systems of differential equations and five direction fields are given below. Determine the system that corresponds to each direction field and sketch the solution curves that correspond to the initial conditions $(x_0, y_0) = (0, 1)$ and $(x_0, y_0) = (1, -1)$.

i. $\frac{dx}{dt} = -x$
 $\frac{dy}{dt} = y - 1$

ii. $\frac{dx}{dt} = x^2 - 1$
 $\frac{dy}{dt} = y$

iii. $\frac{dx}{dt} = x + 2y$
 $\frac{dy}{dt} = -y$

iv. $\frac{dx}{dt} = 2x$
 $\frac{dy}{dt} = y$

v. $\frac{dx}{dt} = x$
 $\frac{dy}{dt} = 2y$

vi. $\frac{dx}{dt} = x - 1$
 $\frac{dy}{dt} = -y$

vii. $\frac{dx}{dt} = x^2 - 1$
 $\frac{dy}{dt} = -y$

viii. $\frac{dx}{dt} = x - 2y$
 $\frac{dy}{dt} = -y$

2.2 EXERCISES

Since these are systems, maybe it's better to put the `aligned` environment within `\left\{` and `\right\}`:

1. Eight systems of differential equations and five direction fields are given below. Determine the system that corresponds to each direction field and sketch the solution curves that correspond to the initial conditions $(x_0, y_0) = (0, 1)$ and $(x_0, y_0) = (1, -1)$.

i.	$\begin{cases} \frac{dx}{dt} = -x \\ \frac{dy}{dt} = y - 1 \end{cases}$	ii.	$\begin{cases} \frac{dx}{dt} = x^2 - 1 \\ \frac{dy}{dt} = y \end{cases}$	iii.	$\begin{cases} \frac{dx}{dt} = x + 2y \\ \frac{dy}{dt} = -y \end{cases}$
iv.	$\begin{cases} \frac{dx}{dt} = 2x \\ \frac{dy}{dt} = y \end{cases}$	v.	$\begin{cases} \frac{dx}{dt} = x \\ \frac{dy}{dt} = 2y \end{cases}$	vi.	$\begin{cases} \frac{dx}{dt} = x - 1 \\ \frac{dy}{dt} = -y \end{cases}$
vii.	$\begin{cases} \frac{dx}{dt} = x^2 - 1 \\ \frac{dy}{dt} = -y \end{cases}$	viii.	$\begin{cases} \frac{dx}{dt} = x - 2y \\ \frac{dy}{dt} = -y \end{cases}$		

Chapter 3

Answer to all problems

CHAPTER 1

Exercises 1.1, page 1

- i.1. This is a solution of Ex 1
- ii. This is a solution of Ex 2
- iii. This is a solution of Ex 3
- i.2. This is a solution of Ex 4
- v. This is a solution of Ex 5
- vi. This is a solution of Ex 6
- vii. This is a solution of Ex 7

Exercises 1.2, page 1

- 1. This is a solution of Ex 1

CHAPTER 2

Exercises 2.1, page 3

- i.1. This is a solution of Ex 1
- ii. This is a solution of Ex 2

- iii. This is a solution of Ex 3
- iv. This is a solution of Ex 4
- v. This is a solution of Ex 5
- vi. This is a solution of Ex 6
- vii. This is a solution of Ex 7
- viii. This is a solution of Ex 8

Exercises 2.2, page 4

- i.1. This is a solution of Ex 1
- ii. This is a solution of Ex 2
- iii. This is a solution of Ex 3
- iv. This is a solution of Ex 4
- v. This is a solution of Ex 5
- vi. This is a solution of Ex 6
- vii. This is a solution of Ex 7
- viii. This is a solution of Ex 8