Chapter 1

First

1.1 EXERCISES

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

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

0**ii.** 0 $\frac{dy}{dx} = 4y^2 - 3y + 1$

0**iii.** 0 $\frac{ds}{dt} = t\ln(s^{2t}) + 8t^2$

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

0**iv.** 0 $\frac{dx}{dt} = 3xt^2$

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

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

0**vii.**0 $\frac{dy}{dt} = \frac{y}{t+1} + 4t^2 + 4t, \qquad y(1) = 10$

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 $(x_0, y_0) = (1, -1)$.

0**i.** 0 $\dfrac{dx}{dt} = -x$
$\dfrac{dy}{dt} = y - 1$

0**ii.** 0 $\dfrac{dx}{dt} = x^2 - 1$
$\dfrac{dy}{dt} = y$

0**iii.** 0 $\dfrac{dx}{dt} = x + 2y$
$\dfrac{dy}{dt} = -y$

0**iv.** 0 $\dfrac{dx}{dt} = 2x$
$\dfrac{dy}{dt} = y$

0**v.** 0 $\dfrac{dx}{dt} = x$
$\dfrac{dy}{dt} = 2y$

0**vi.** 0 $\dfrac{dx}{dt} = x - 1$
$\dfrac{dy}{dt} = -y$

0**vii.**0 $\dfrac{dx}{dt} = x^2 - 1$
$\dfrac{dy}{dt} = -y$

0**viii**0 $\dfrac{dx}{dt} = x - 2y$
$\dfrac{dy}{dt} = -y$

2.2 EXERCISES

Since these are systems, maybe it's better to put the `aligned` enviroment 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 $(x_0, y_0) = (1, -1)$.

0**i.** $$0\begin{cases} \dfrac{dx}{dt} = -x \\ \dfrac{dy}{dt} = y - 1 \end{cases}$$

0**ii.** $$0\begin{cases} \dfrac{dx}{dt} = x^2 - 1 \\ \dfrac{dy}{dt} = y \end{cases}$$

0**iii.** $$0\begin{cases} \dfrac{dx}{dt} = x + 2y \\ \dfrac{dy}{dt} = -y \end{cases}$$

0**iv.** $$0\begin{cases} \dfrac{dx}{dt} = 2x \\ \dfrac{dy}{dt} = y \end{cases}$$

0**v.** $$0\begin{cases} \dfrac{dx}{dt} = x \\ \dfrac{dy}{dt} = 2y \end{cases}$$

0**vi.** $$0\begin{cases} \dfrac{dx}{dt} = x - 1 \\ \dfrac{dy}{dt} = -y \end{cases}$$

0**vii.** $$0\begin{cases} \dfrac{dx}{dt} = x^2 - 1 \\ \dfrac{dy}{dt} = -y \end{cases}$$

0**viii** $$0\begin{cases} \dfrac{dx}{dt} = x - 2y \\ \dfrac{dy}{dt} = -y \end{cases}$$

Chapter 3

Answer to all problems

CHAPTER 1

Exercises 1.1, page 1

1.

0i. 0This is a solution of Ex 1

0ii. 0This is a solution of Ex 2

0iii. 0This is a solution of Ex 3

2.

0iv. 0This is a solution of Ex 4

0v. 0This is a solution of Ex 5

0vi. 0This is a solution of Ex 6

0vii. 0This 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

1.

0i. 0This is a solution of Ex 1

0ii. 0This is a solution of Ex 2

0iii. 0This is a solution of Ex 3

0iv. 0This is a solution of Ex 4

0v. 0This is a solution of Ex 5

0vi. 0This is a solution of Ex 6

0vii. 0This is a solution of Ex 7

0viii 0This is a solution of Ex 8

Exercises 2.2, page 4

1.

0i. 0This is a solution of Ex 1

0ii. 0This is a solution of Ex 2

0iii. 0This is a solution of Ex 3

0iv. 0This is a solution of Ex 4

0v. 0This is a solution of Ex 5

0vi. 0This is a solution of Ex 6

0vii. 0This is a solution of Ex 7

0viii 0This is a solution of Ex 8