

## Runge-Kutta assignment 2

Use RK2

$$\begin{array}{c|c} \frac{1}{7} & \frac{1}{7} \\ \hline & -\frac{5}{2} \quad \frac{7}{2} \end{array}$$

to solve

$$y'' = e^{ax} \sin bx + cy + dy'$$

with  $y(2) = p$  and  $y'(2) = q$ . Obtain the solution at  $x = 2.1$  using  $h = 0.1$ , and the solutions at  $x = 2.05$  and  $x = 2.1$  using  $h = 0.05$ . Use these results to estimate the local error coefficient at  $x = 2.1$ . The parameters  $a, b, c, d, p$  and  $q$  are given in the Table below. If you utilize a calculator, all calculational detail must be shown. If you utilize a program, a listing of the code must be given. In either case, the values of the stages in RK2 must be given, in addition to the solutions.

Table of problem parameters

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>	<b>H</b>	<b>I</b>	<b>J</b>	<b>K</b>	<b>L</b>	<b>M</b>
<i>a</i>	1	3	3	1	2	2	1	1	3	2	2	3	3
<i>b</i>	2	2	2	2	3	3	2	3	2	2	1	1	2
<i>c</i>	-1	-2	-3	-2	-2	-1	-1	-3	-3	-1	-3	-2	-2
<i>d</i>	3	2	4	1	3	2	1	2	2	4	1	2	4
<i>p</i>	-2	-1	-2	-1	-2	-1	-2	-1	-3	-2	-1	-3	-1
<i>q</i>	-1	-2	-2	-2	-3	-3	-3	-1	-2	-3	-2	-1	-2