DEPARTMENT OF MATHEMATICS

MATHS 260 Tutorial Week 3

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1. (a) Some go to $+\infty$ and some to $-\infty$.
   (b) Straight line solution.
   (c) If $y_0 > -\frac{1}{2}t_0 - \frac{1}{4}$, then $y \to +\infty$, otherwise to $-\infty$.
2. (a)
   (b) It will be 1.
   (c) $y_1 = 1$, $y_2 = 2$.
   (d) $y(0) = 13.3995$ so the error is 11.3995.
   (e) Effective order tends to 1.
   (f) Effective order tends to 2 for Improved Euler and to 4 for 4th order Runge-Kutta.
3. Using 4th order Runge-Kutta, we see the solution is 7.327 to 3 d.p. This is obtained in 2 steps for Runge-Kutta, approximately 32 steps for Improved Euler and over 512 steps for Euler.