$a.01$

$\theta_2' = \theta_2$

$\theta_2' = -\dfrac{g}{L} \sin \theta_1$

$\bigg|\quad \theta = \theta_L$

i) $\dfrac{d\theta_1}{dt} = f_1(t, \theta_1, \theta_2) = \theta_2$

$\dfrac{d\theta_2}{dt} = f_2(t, \theta_1, \theta_2) = -\dfrac{g}{L} \sin \theta_1$

initial conditions:

$\theta(t=0) = 0$, and $\dfrac{d\theta}{dt}\bigg|_{t=0} = 0$

$\Rightarrow \theta_1[0] = \theta_0$, $\theta_2[0] = 0$, $L = 10$ cm

$\rightarrow$ Solve using Simple Euler's method.

ii) $\theta_0 = 10°$

Simple Euler : $y(x_0 + h) = y_0 + h f_0$

$\llcorner$ function:

$\llcorner$ Euler_Cb (x, x_0, y_0, z_0, f_y, f_z, tolerance)

return value at (x).

$x = t$, $\theta_1 = y$, $\theta_2 = z$

$\dfrac{dy}{dt} = z$ $\qquad \dfrac{dz}{dt} = \left(-\dfrac{g}{L}\right) \sin(y)$

$\boxed{y \begin{array}{|l} x_0 = 0 \end{array}, \quad y_0 = \theta_0 \quad , \quad z_0 = 0 = \dfrac{d\theta_1}{dt}}$