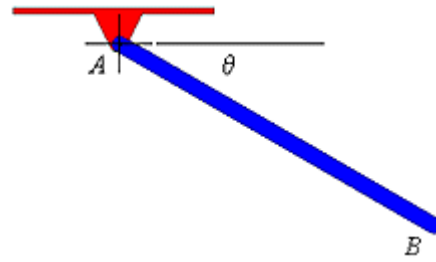


單擺分析



AB 是一根單擺，長 450mm，直徑 20mm，質量 2kg，向右旋(CW)30 度，具有 3rad/s 之初角速度，試求 A 端作用力與瞬間初角加速度。

Look at Front: 從+X 軸往原點看

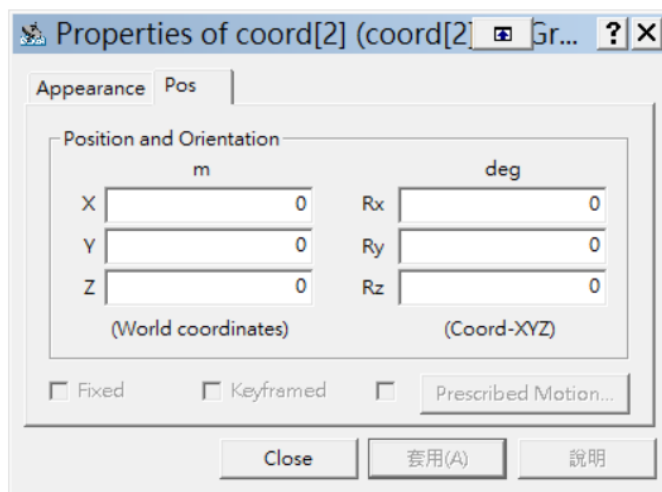
Look at Right: 從+Y 軸往原點看

Look at Top: 從+Z 軸往原點看

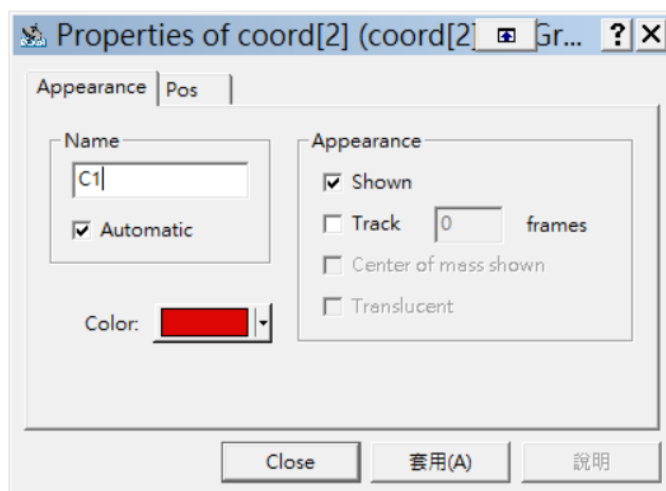
Gravity 方向: -Z

Step1: 定義固定接點

用  (Coord) 在畫面上分別設定一點 C1(0, 0, 0)

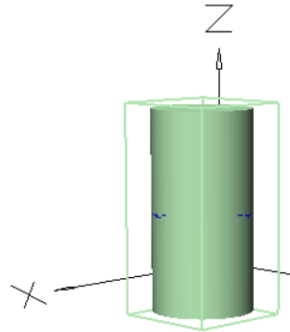
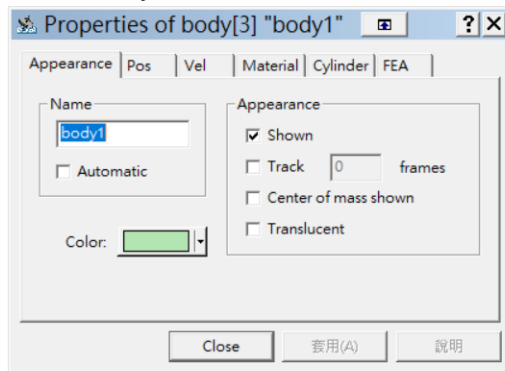


按 Appearance 將 Name 更改為 C1

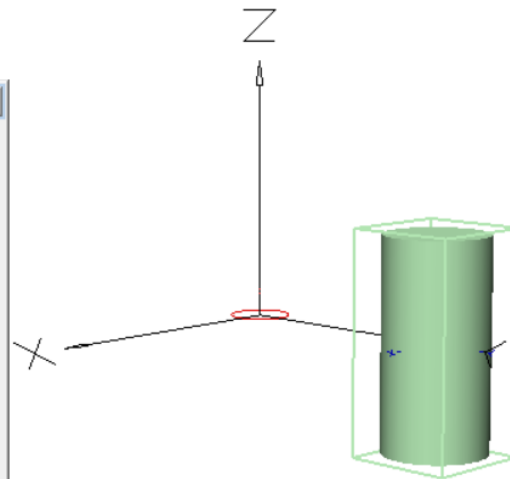
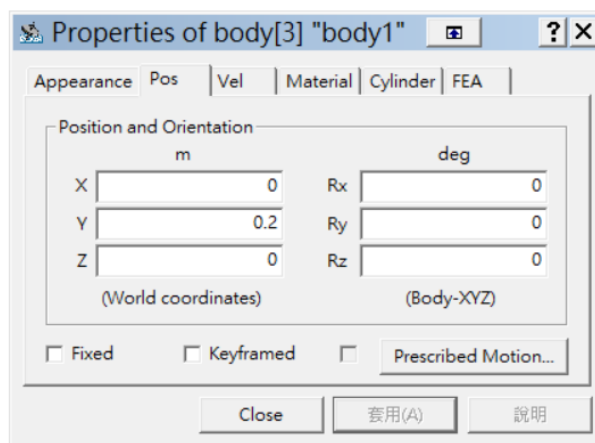


Step2: 定義物體

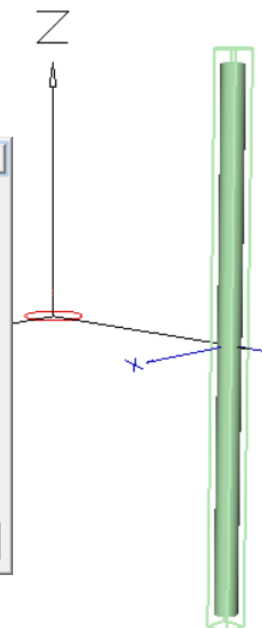
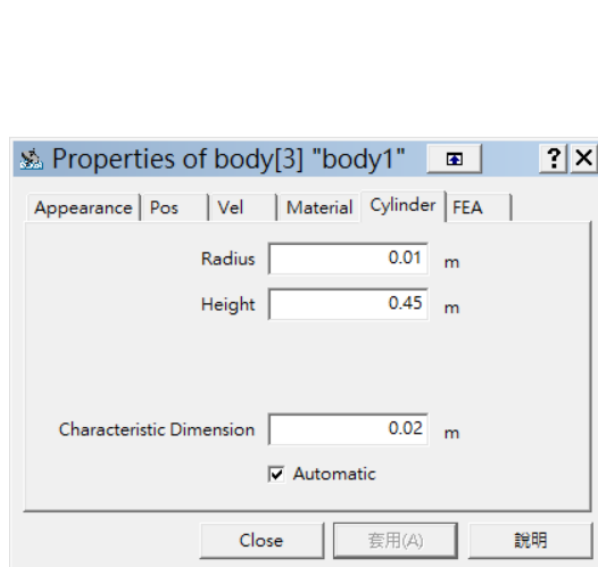
用  (Cylinder) 在畫面上畫出一個圓柱體，然後按右鍵選 Property，將 Name 設定為 body1； $H=0.45\text{m}$ ，Radius 皆為 0.01m



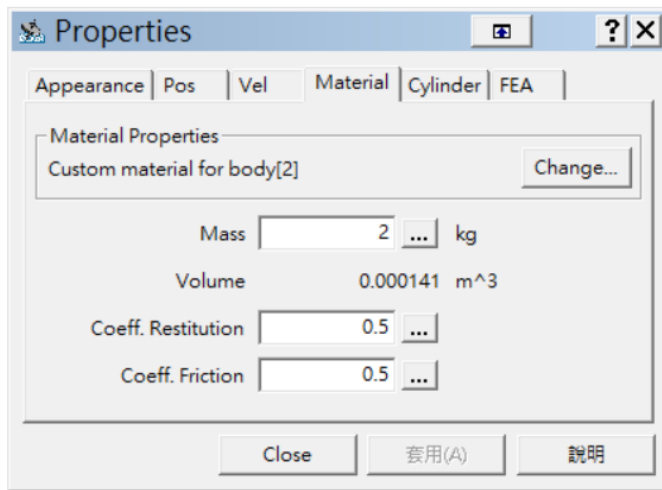
按 Pos 將(X, Y, Z)設定為(0, 0.2, 0)；



按 Cylinder 將 Radius 設定為 0.01m ，將 Height 設定為 0.45m ；

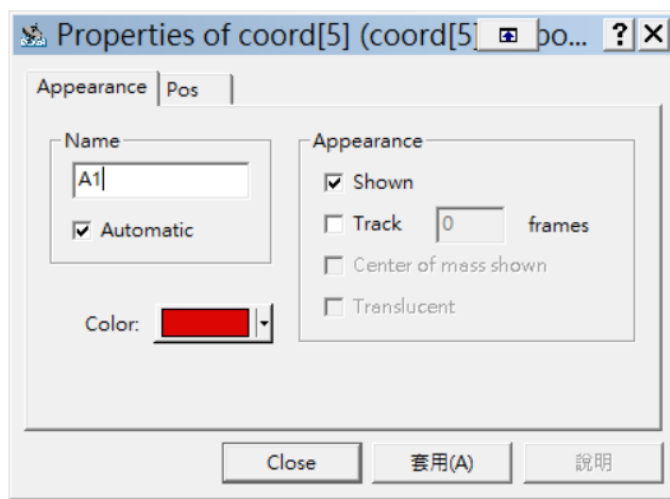


按 Material 將 Mass 設定為 2kg；



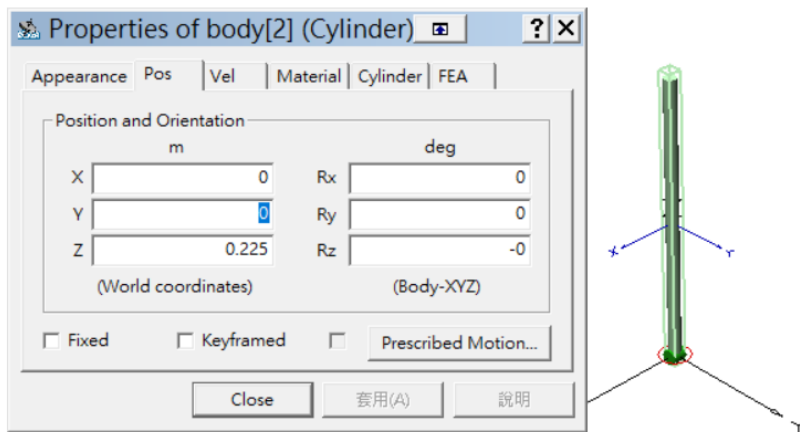
Step3: 定義物體上的接點

用  (Coord) 放在 body1 的下端的中心部位: View/Look At Bottom 設為 A1。

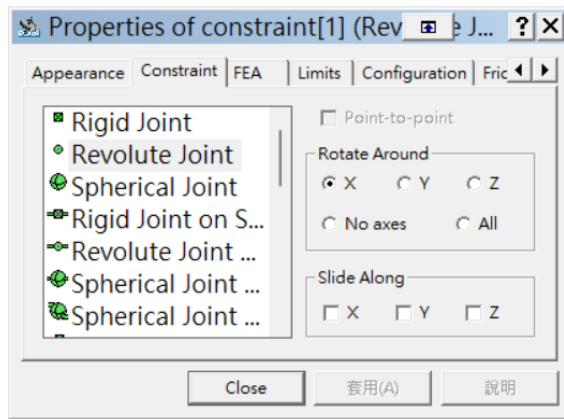


Step4: 聯結

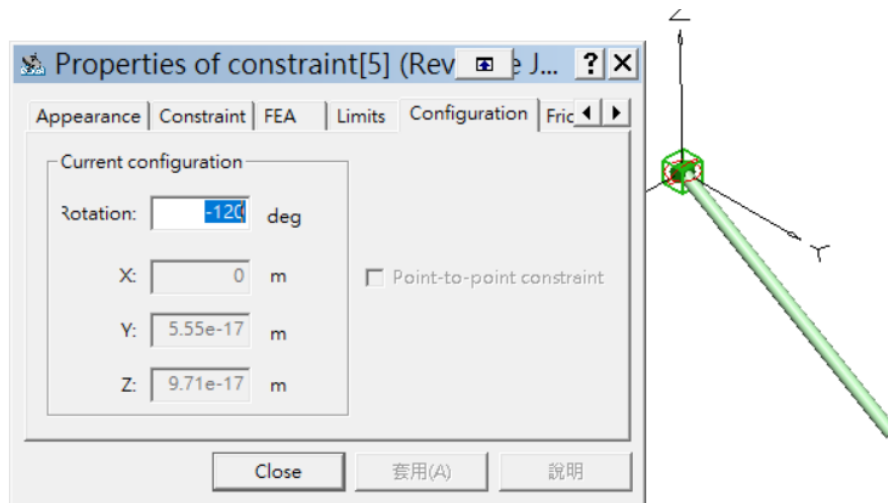
先點選 C1，再長按 Shift 鍵，然後點選 body1 上的 A1，接著按  選擇 Revolute Joint



點選 Revolute Joint 按右鍵點選 Properties，再按 Constraint 將旋轉軸更改為 X 軸

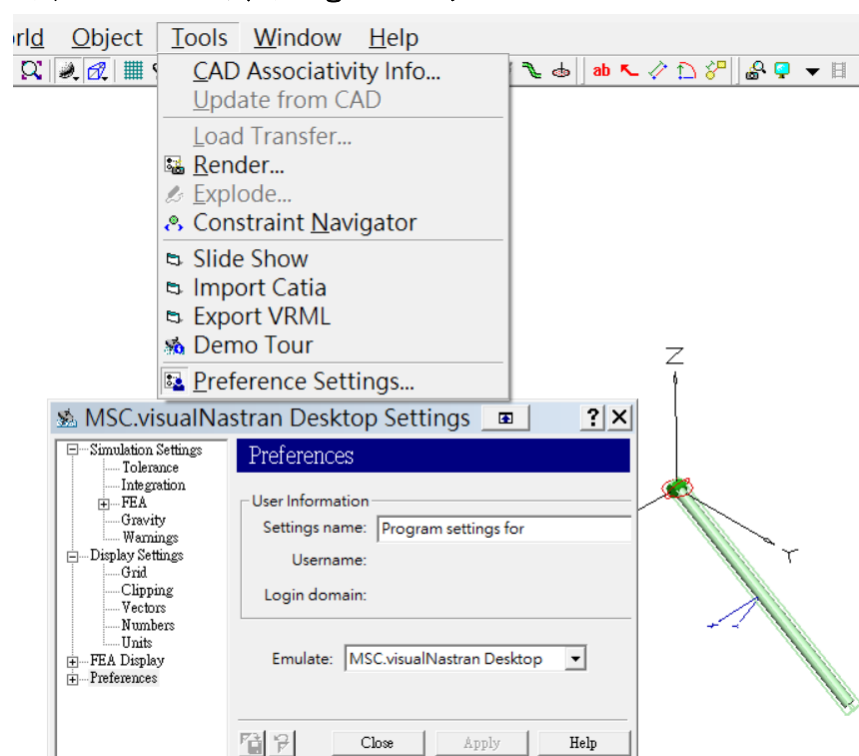


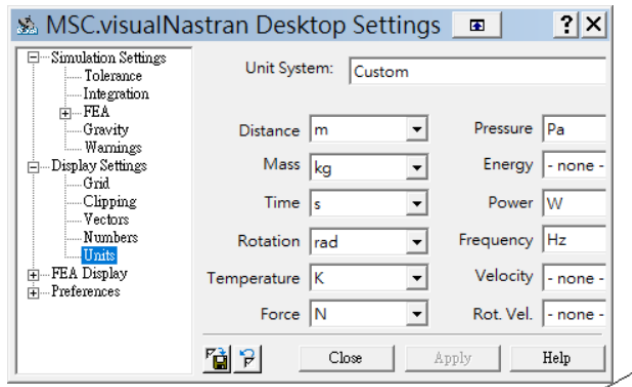
點選 Revolute Joint 按右鍵點選 Properties，再按 Configuration 將旋轉角度更改為-120 度



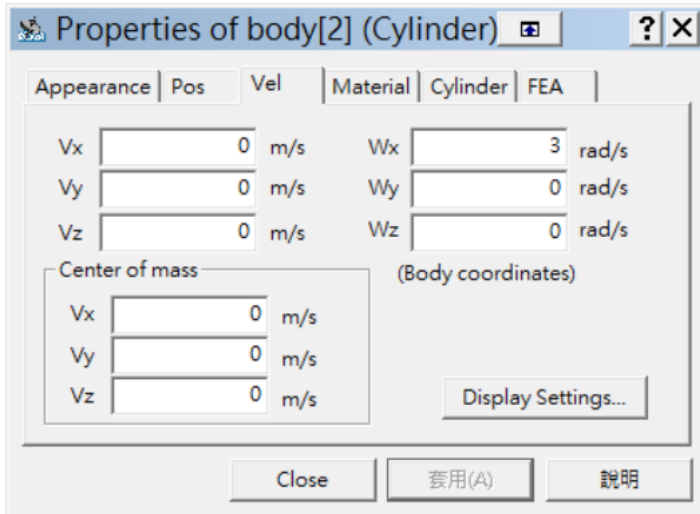
Step5: 設定初角速度

先更改角度單位從下拉式功能表 Tools 選 Preference Settings 再按 Units，請將在 Rotation 欄將 degree 改為 rad



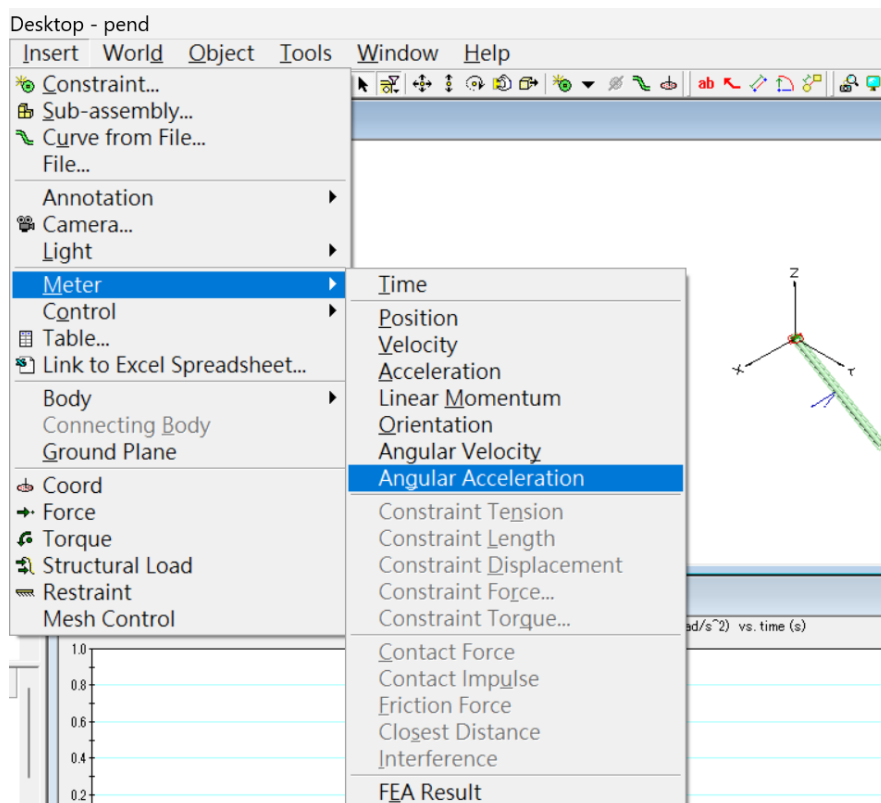


點選 Body1 按右鍵點選 Properties，再按 Vel 將 Wx 更改為 3 rad/s

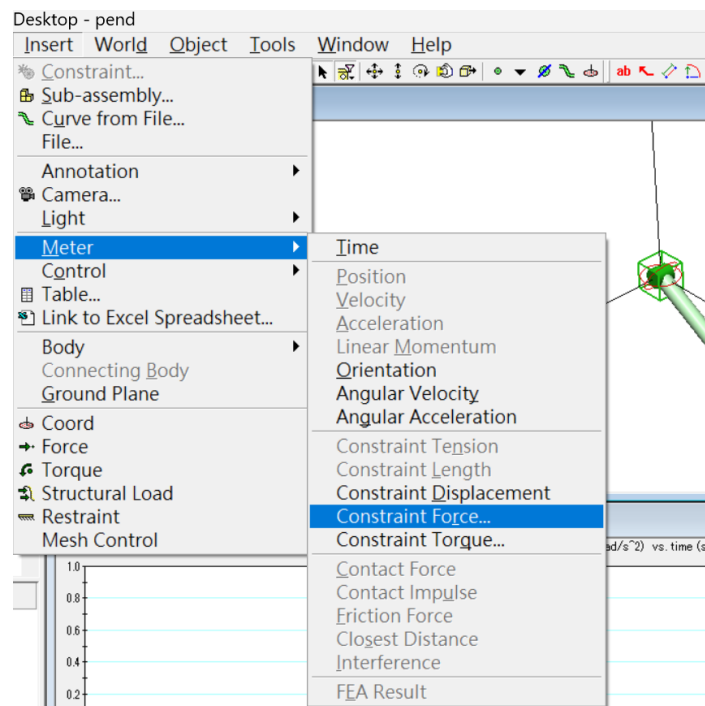


Step6: 開始模擬

設定量測角加速度參數顯示圖表，先選 Body1 再從下拉式功能表 Insert 選 Meter 再按 Angular Acceleration



設定量測接頭反作用力參數顯示圖表，先選 Revolute Joint 再從下拉式功能表 Insert 選 Meter 再按 Constraint Force



點選  即開始模擬,  即為回起始值

