let
$$V(x) = \frac{1}{2} x_1^2 + \frac{1}{2} x_2^2$$
 which is p.d.

 $V(x) = x_1 \cdot x_1 + x_2 \cdot x_3$
 $= -x_1^4 + 2x_1 x_2^3 - 2x_1 x_2^3$
 $= -x_1^4$ which is n.d. not negative definite

 $= -x_1^4$ which is n.d. not negative definite

Hence, the origin is an asymptotically stable solution of the system Can use LaSalle to finish proof

let
$$U = X_1$$
 then: $\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \\ 0 = X_3 \end{bmatrix} = \begin{bmatrix} 0 \\ -\frac{m(X_2 + 1)^2}{1 + m(X_2 + 1)^2} \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \end{bmatrix}$

$$\begin{bmatrix} g_1, g_2 \end{bmatrix} = \begin{bmatrix} 0 \\ 2m(X_2 + 1) \end{bmatrix} = \begin{bmatrix} g_2 \\ 0 \end{bmatrix}$$

$$= g_3 \quad \text{which is independent to } g_1 g_2$$

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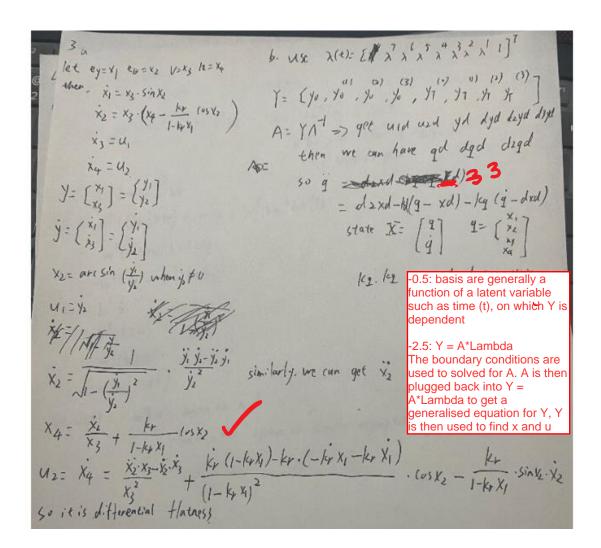
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$$\begin{aligned}
& (g_1, g_2) = \begin{pmatrix} 0 \\ 0 \\ 2X_2 \end{pmatrix} - \begin{pmatrix} 0 \\ 0 \\ 2X_2 \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 2X_2 \end{pmatrix} - \begin{pmatrix} 0 \\ 0 \\ 2X_2 \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 2X$$



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let u = -kw - (b \times b \circ) - 3w^2 b \times (1b)

V(x) = \int_{1}^{2} w^7 lw + 1 - b^7 bo since \int_{1}^{2} w^7 lw + 1 - b^7 bo since \int_{1}^{2} w^7 lw + 1 - b^7 bo > 0

V(x) = \int_{1}^{2} w^7 lw + 1 - b^7 bo > 0

V(x) = \int_{1}^{2} w^7 lw - b^7 bo > 0

V(x) = \int_{1}^{2} w^7 lw - b^7 bo > 0

V(x) = \int_{1}^{2} w^7 lw - b^7 bo > 0

V(x) = \int_{1}^{2} w^7 lw + w^7 lw +
```