PHY 321, MARCH 2, 2022

$$w_0 = \sqrt{4/m} \qquad T = w_0, t$$

$$v = \frac{b}{2mw_0}$$

$$\frac{d^2x}{d^2x} + 2y \frac{dx}{d^2x} + x$$

$$= \frac{v}{v_0} \cos(w^2)$$

$$\tilde{w} = \frac{w}{w_0}$$

$$T_0 = 0$$
Homogeneous solution
$$x(T) = A_1 e + A_2 e$$

$$x(T) = A_1 e + A_2 e$$

$$x_1 = -v + \sqrt{v^2-1}$$

$$v = -v - \sqrt{v^2-1}$$

$$v = 1 \qquad \text{Underdamping}$$

$$v = 1 \qquad \text{Our enitical damping}$$

solution. xp(r) = D cos(W7-5) plug m to the ODE $D \begin{cases} - w \cos(w \tau - \delta) \\ - 28 w mn (w \tau - \delta) \end{cases}$ + cos(w7-5)} =
Fo cos (w7) nm (a + p) = nnacosp + nuscosa cos (x + B) = cos x ros B + ning ning D} (-w cos S + 2 z w nus S + cos 8) cos (w7) $+\left(-w^{2}mes-2+wcoss$ +mus)nm(wz)= 70 005 (207) _ w nm5-2+w 2055

$$+ nmd = 0$$

$$> D, ude ly cos S = 7$$

$$tan S = \frac{2 \pi n^{3}}{1 - n^{2}}$$

$$nmS = \frac{tan S}{\sqrt{tan^{2}S - 1}}$$

$$cas S = 1 - nm^{3}S$$

$$nmS = \frac{2 \pi n^{3}}{\sqrt{(1 - n^{3})^{2} + 4 \pi^{2}n^{2}}}$$

$$cas S = (1 - n^{2})^{2} + 4 \pi^{2}n^{2}$$

$$imset back into ode$$

$$D = \frac{7c}{\sqrt{(1 - n^{2})^{2} + 4 n^{2}n^{2}}}$$

$$S = 6au^{\frac{1}{2}} \left(\frac{2 + w}{1 - w^{2}} \right)$$

$$W = W_{0} = 7$$

$$W = 1$$

$$V = \frac{b}{2w} w_{0}$$

$$V = \frac{b}{2w} w_{0}$$

$$V = \frac{b}{2w} v_{0}$$

 $= -2 Vo R \cdot \frac{2}{R}$ $= -2 Vo R \cdot \frac{2}{R}$