TM5 Pr2 3.16

DISCUSS THE MOTION OF A PARTICLE DESCRIBED BY EQ^{N} 3.34 IN THE EVENT THAT $b<0$ (ie. THE DAMPING IS NEGATIVE).

(3.34) $m\ddot{x} + b\dot{x} + kx = 0$

FOR $b<0 \Rightarrow \beta = \frac{b}{2m} < 0$ AND IN THE SOLUTION

$$x(t) = e^{-\beta t}\left[A_1 e^{\sqrt{\beta^2-\omega_0^2}\,t} + A_2 e^{-\sqrt{\beta^2-\omega_0^2}\,t}\right],$$

$e^{-\beta t}$ HAS A POSITIVE EXPONENT

$\Rightarrow e^{-\beta t} \longrightarrow \infty$ FOR $\beta < 0$

$\Rightarrow$ IT BLOWS UP!