$$-A\frac{dh}{dt} = k_1 h^n$$

$$\frac{dh}{dt} = k_1 h^n \quad \text{let} \left(\frac{k_1}{A} = k\right)$$

$$\int_{h_0}^{h(t)} \frac{dh}{h^n} = -\int_0^t k\,dt$$

$$\left(\frac{h^{-n+1}}{1-n}\right)_{h_0}^{h} = -(kt)$$

$$h = \left((1-n)\left[\frac{h_0^{1-n}}{1-n} - kt\right]\right)^{1/1-n}$$

for both $n>1$ & $n<1$

h will decrease with time

so will have to check differential equation

$$\left(\frac{1}{h}\right)\frac{dh}{dt} = \frac{\cancel{1}}{\cancel{(n-1)}}\left(\frac{1}{1-n}\right)^2\left(\frac{1}{\left[\frac{h_0^{1-n}}{(n-1)} + \frac{kt}{\cancel{A}}\right]}\right) \cdot \frac{(n-1)k}{A}$$

{in class solved}

$n \cancel{<} 1$ for increasing t slope is decreasing

$\therefore$ $n<1$