

Read: Sections 1-2 Chapter 8 of Boas

- (1) You might have wondered what the optimists' equation would have done if we recipricated the right hand side like this

$$\frac{d\varphi}{dt} = \frac{\alpha}{2} \frac{1}{\varphi}.$$

(I added the 1/2 for fun.) Solve this ODE. Is this 'optimistic'? If so, what sort of growth is it? If not, what is the behavior?

- (2) Obtain the general solution $u(x)$ of

$$x \frac{du}{dx} + u^2 = 4.$$