

2009 Day 1 Q2 (Asymptotics)

$$y'' + Q(x)y = 0$$

a. Flux  $S(x) = \frac{(yy'')'}{|y|^2} = y' y'' - y'' y'$

Note  $S'(x) = y'' y'' - y'' y'' = 0$

$$y'' + Q(x)y = 0$$

$$y'' y'' + Q y y'' = 0$$

$$y y'''' + Q y y'' = 0$$

→

$$y'' y'' - y y'''' = 0$$

$$S'(x) = 0$$

Thus flux is conserved.