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Homework 2

All calculations can be found in the notebook
`https://github.com/meredith-durbin/ASTR531/blob/master/HW2/HW2.ipynb`.

8.2 (a)

9.1 Timescales for various stars:

Star	$\tau_{\rm dyn}$	$\tau_{\rm KH}$	$\tau_{\rm nucl}$
MS, 1 $M_\odot$	0.906 h	3.140×10^7 yr	10^{10} yr
MS, 60 $M_\odot$	6.792 h	9.487×10^3 yr	7.554×10^5 yr
RSG, 15 $M_\odot$	5.056 yr	4.793 yr	3.358×10^5 yr
WD, 0.6 $M_\odot$	7.142 s	7.945×10^{10} yr	—

9.2 If nuclear fusion in the sun were to suddenly stop, it would take approximately a thermal timescale to notice.

11.2 (a)

Mass				
0.1 $M_\odot$				
1 $M_\odot$				
10 $M_\odot$				
100 $M_\odot$				

12.2 (a)

13.2 For X = Y = 0.49, the luminosity, radius, and $T_{\rm eff}$ are respectively 227.8%, 111.5%, and 123.3% of the corresponding quantities at solar abundances.