

HOMEWORK 5 SOLUTIONS

CHAPTER 9

4.A A red giant star will still be undergoing fusion but not in the core. Shells surrounding the core will be fusing hydrogen into helium (outermost layer), helium into carbon (next layer in), etc. Core fusion only takes place in main sequence stars.

CHAPTER 10

1.A As the mass of a white dwarf increases towards 1.4 solar masses, the radius of the white dwarf decreases. Jupiter has the largest radius of all the options. The radius of the 0.6 solar mass white dwarf will be slightly larger than the radius of the Earth. The radius of the 1.2 solar mass star will be about half the radius of the Earth.

4.C Since the Earth would not be within the event horizon of the black hole, the Earth's orbit will not change. Since the Sun is so far away, it appears to the Earth to be a point source. The black hole will also appear to be a point source so the orbit will not change.

CHAPTER 11

1.C The halo is home to old, metal-poor stars. Globular clusters contain some of the oldest stars in the Milky Way; they may have been the precursors to the Milky Way itself.

3.C The Sun is about 75 percent hydrogen and it formed about 5 billion years ago. Since that time, the makeup of the gas in the area around the Sun has changed. There is slightly less hydrogen than when the Sun formed; more of the hydrogen has been turned into metals.

EXTRA CREDIT: CHAPTER 9, 16

$$\frac{360^\circ}{24hr} = 15^\circ/hr \quad (1)$$

The sky moves through 15 degrees per hour and if the Sun has an angular size of 30 degrees, sunrise and sunset will take about 2 hours each. The sky should be redder than it is now (so a yellowish color).