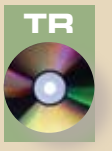
ASTROPHYSICS: REVIEW QUESTIONS

Working with the HSC verbs

1. Explain why astronomy has been largely limited to observations in the visible and radio wavebands up until the last few decades.
2. Describe the effects of doubling the diameter of the objective lens or mirror on the sensitivity and resolution of a telescope.
3. Compare and contrast adaptive optics and active optics.
4. A Cepheid variable is found to be 800 pc away. Explain why this star's distance was *not* calculated using trigonometric parallax from ground-based observatories.
5. Find the distance to a star which has a parallax angle of 12.4 milli arcseconds.
6. Describe how the spectral classification of a star can be found.
7. Evaluate the analysis of a star's spectrum in terms of the information found about the star.
8. Outline why the absorption spectrum for the element potassium has dark lines at the same wavelengths as potassium's emission spectral lines.
9. A star has an apparent magnitude greater than its absolute magnitude. Explain why this star is more than 10 pc away.
10. Describe the advantages of photoelectric technologies over photographic methods when used in photometry.
11. *Spectroscopic parallax is used more than trigonometric parallax to find distances to stars*. Justify this statement.
12. Calculate the combined mass of a binary system if the two stars are separated by a distance of 4.5×10^{11} m and their orbital period is 2.5 years.
13. Compare the way in which visual and astrometric binary systems are identified.
14. A Cepheid variable has a period of 10 days and an apparent magnitude of +17.0.
    (a) Sketch a graph of this star's light curve
    (b) Using information found in Figure 26.7, calculate the distance to this Cepheid variable.
15. Outline the steps taken in determining the age of a globular cluster using a plot of its zero-age main sequence on an HR diagram.
16. Compare and contrast the types of nuclear reactions in main-sequence and post-main-sequence stars.
17. Explain why a star of 10 solar masses is not likely to end its life as a white dwarf. Explain.
18. Compare the HR diagram plot of an open cluster of stars with that of a globular cluster.



Verb scaffolds
Working with the verbs
Sample answers and marking criteria