

Physics 90 Exam for Unit 4 — SOLUTION

May 4, 2020

1. Parallax

(C) 1 parsec

2. Parallax

(D) 0.45 arcseconds. (If the baseline is increased by 1.5, then the angle is increased by 1.5.)

3. Parallax

(E) 3 light-years

4. Parallax

(B) $\frac{4}{3}$ of a parsec away

5. Parallax

(A) 200 parsecs

6. Inverse Square Law for Light

(D) $\frac{1}{9}$ the intensity of Star 2

7. Inverse Square Law for Light

(A) 100 times brighter

8. Absolute Magnitude

(D) 3

9. Absolute Magnitude

(C) Its apparent magnitude if you imagine moving it to 10 parsecs.

Hertzsprung-Russell (HR) Diagrams

The four problems on the next page refer to the letters on this figure (sorry for fuzzy scan):

10. HR Diagrams

(C) C.

11. HR Diagrams

(A) A.

12. HR Diagrams

(D) D.

13. HR Diagrams

(B) B.

14. HR Diagrams

- (B) -1.5
- (C) +4
- (D) +9.5

15. HR Diagrams

(A) the main sequence

16. Birth of Stars

(C) regions of interstellar gas that have achieved sufficient density to collapse into stars

17. Birth of Stars

(C) as a main sequence star

18. Death of Stars

(B) by enlarging to a red giant and then becoming a nova, leaving a white dwarf

19. Death of Stars

(C) by enlarging to a red giant and then becoming a supernova, leaving a neutron star

20. Death of Stars

(F) All of the above, and our galaxy contains crazy and beautiful things.