

NOTE: answers in **RED**
have clarifications at the
bottom of the page!

Test #: _____ Time: _____

Astronomy – 2019 – Answer key

Section 1 (1 pt per question unless marked otherwise)

Subscore: _____/24

- | | | | | |
|-----------------|------------------|-----------------|---------------------|----------------------------|
| 1. <u>Cen A</u> | 6. <u>C</u> | 10. <u>M 51</u> | 16. <u>NGC 4993</u> | 21. <u>Phoenix Cluster</u> |
| 2. <u>A</u> | 7. <u>47 Tuc</u> | 11. <u>A</u> | 17. <u>D</u> | 22. <u>A</u> |
| 3. <u>X-ray</u> | 8. <u>D</u> | 12. <u>A</u> | 18. <u>B</u> | 23. <u>A</u> |
| 4. <u>C</u> | 9. <u>A</u> | 13. <u>D</u> | 19. <u>B</u> | 24. <u>B</u> |
| 5. <u>A</u> | | 14. <u>A</u> | 20. <u>C</u> | |
| | | 15. <u>D</u> | | |

Section 2 (1 pt per question unless marked otherwise)

Subscore: _____/16

- | | | | |
|--------------|--------------|--------------|---|
| 25. <u>2</u> | 29. <u>A</u> | 33. <u>B</u> | 37. <u>D</u> |
| 26. <u>2</u> | 30. <u>A</u> | 34. <u>D</u> | 38. <u>(3) 1.03×10⁴ * pc</u> |
| 27. <u>D</u> | 31. <u>D</u> | 35. <u>C</u> | |
| 28. <u>A</u> | 32. <u>B</u> | 36. <u>B</u> | |

Section 3 (point values next to each question number)

Subscore: _____/26

- | | | |
|--|-------------------------------------|--|
| 39. <u>(2) -23.97 * mag</u> | 42. <u>(3) 0.57 * M_⊙</u> | 45. <u>(2) 2.38×10³ * AU</u> |
| 40. <u>(2/1) 41.2 * mag</u> | 43. <u>(2) 0.13 * M_⊙</u> | 46. <u>(3/1) 4.41×10⁶ * M_⊙</u> |
| 41. <u>(3/1) 1.7×10⁹ * pc</u> | 44. <u>(4) 49.5 * d</u> | 47. <u>(3/1) 57 * AU</u> |
| | | 48. <u>(2) A, C, D</u> |

Scoring Notes

Answers with * must be exactly as written;
use of scientific notation optional (see test
for why).

- Also accept Centaurus A.
- Also accept 47 Tucanae. **Do not** accept an answer with X9 in it!
- Also accept NGC 5195 or Whirlpool Galaxy.

- Accept 19.3 for **1 pt**.
- Accept 1.0×10^4 for **1 pt**.
- Accept 1.17×10^{12} for **1 pt**.
- Accept 3.7×10^3 for **1 pt**.
- No partial credit. All letters must be present (and no extras), but order doesn't matter.

Tiebreakers: Section 1 subscore, section 3 subscore, time