

**Question 4****(5 marks)**

Sirius appears as the brightest star in the night sky. It is actually a binary star consisting of Sirius A, a large blue-white star, and Sirius B, a white dwarf. Our view of the Sirius star system is such that there are times when Sirius B is coming toward us and times when it is going away from us. When Sirius B is moving toward us:

(a) Sirius A will be (1 mark)

- A moving toward us, relative to Sirius B.
- B moving away from us, relative to Sirius B.

Your answer \_\_\_\_\_

(b) Compared to the speed of light approaching us from Sirius A, the speed of the light approaching us from Sirius B will be (1 mark)

- A the same.
- B less.
- C greater.

Your answer \_\_\_\_\_

(c) An astronomer views a spectrum of the visible light from Sirius B. Describe **one** feature of this spectrum that would indicate Sirius B is moving toward the astronomer. (2 marks)

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(d) Big Bang theory predicts the Sirius system should be (1 mark)

- A moving toward us.
- B moving away from us.
- C keeping a constant distance.

Your answer \_\_\_\_\_