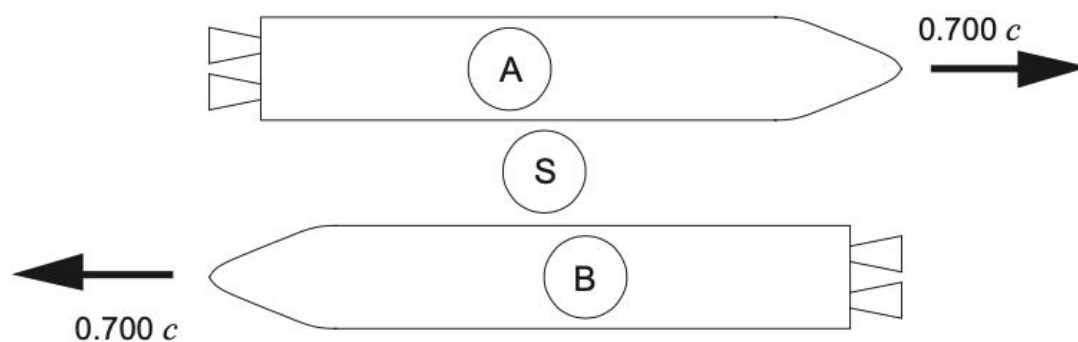


Question 14

(13 marks)



Two 5.00×10^2 m long identical spaceships, 'A' and 'B', pass by an observer S while moving in opposite directions. The observer S measures the velocity of spaceship A as $0.700c$ and spaceship B as $-0.700c$.

- (a) (i) Calculate the velocity of A (in m s^{-1}) as measured by B. (4 marks)

Answer: _____ m s^{-1}

- (ii) Explain why the magnitude of the velocity of B as measured by A would be the same as your answer for part (a)(i), only in the opposite direction. (3 marks)

- (b) Calculate the duration of one second on A as measured by the observer S. (3 marks)

Answer: _____ s

- (c) Calculate the length of B as measured by A. If you could not obtain an answer to part (a)(i), use $0.870\ c$. (3 marks)

Answer: _____ m