

44. In his theory of special relativity, Einstein
 - a. abandoned the Galilean principle of relativity.
 - b. abandoned Maxwell's equations for electricity and magnetism.
 - c. reconciled the apparent conflict between the Galilean principle of relativity and Maxwell's equations.
 - d. postulated the existence of an absolute reference system.
 - e. postulated that the speed of light is constant in vacuum, and the same in all inertial frames.
 - f. All of the above completions yield true statements.
 - g. None of the above.
45. The second postulate of special relativity does NOT require that the speed of light
 - a. is a constant in a vacuum and equal to c.
 - b. is independent of the motion of the receiver.
 - c. is independent of the motion of the source.
 - d. is independent of the direction of propagation
 - e. In fact, the second postulate requires all of the above.
46. As a friend passed you at a very high speed, she reported that she simultaneously exploded a firecracker at each end of her skateboard. Which one exploded first from your point of view?
 - a. the one at the front
 - b. the one at the back
 - c. They exploded simultaneously.
 - d. The answer depends on the speed of the skateboard.
 - e. None of the above is a correct answer to the question.
47. If inertial mass and gravitational mass were NOT the same,
 - a. the law of universal gravitation would need to be modified.
 - b. Newton's second law would need to be modified.
 - c. objects with different masses falling in a vacuum near the earth's surface would no longer experience the same acceleration.
 - d. objects falling in a vacuum near the earth's would no longer experience a force proportional to their gravitational mass.
 - e. All of the above statements are true.
48. Superman wants to travel back to his native Krypton for a visit, a distance of 3×10^{13} meters. (At nearly the speed of light, it takes light nearly 10^5 seconds to travel this distance.) If Superman is able to hold his breath for 10^3 s and travel at any speed less than that of light, can he make it before he suffocates?
 - a. Not unless he stops off for a breath on his way.
 - b. Not unless he goes faster than light.
 - c. No way.
 - d. Yes, because in his frame his biological clock slows down to give him more time
 - e. Yes because in his frame of reference the distance is contracted to a much smaller value.