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acceleration is the name we give to any process where the velocity changes since velocity is a speed and a direction there are only two ways for you to accelerate change your speed or change your direction or change both the plus sign in the answer means that acceleration is to the right this is a reasonable conclusion because the train starts from rest and ends up with a velocity directed to the right i e positive acceleration is the rate at which they change their velocity acceleration is a vector quantity that is it has a direction associated with it the direction of the acceleration depends upon which direction the object is moving and whether it is speeding up or slowing down the answer is that a change in motion is equivalent to a change in velocity a change in velocity means by definition that there is an acceleration newton s first law says that a net external force causes a change in motion thus we see that a net external force causes acceleration acceleration a is the change in velocity Δv over the change in time Δt represented by the equation a Δv Δt this allows you to measure how fast velocity changes in meters per second squared m s 2 an airplane lands on a runway traveling east describe its acceleration answer if we take east to be positive then the airplane has negative acceleration as it is accelerating toward the west it is also decelerating its acceleration is opposite in direction to its velocity we can describe acceleration as the change in velocity over time and we can use the shorthand equation a Δ v Δ t to represent this relationship where a is the average acceleration v is velocity and t is time the Δ is a greek symbol that means change define and distinguish between velocity and acceleration and between instantaneous and average acceleration calculate acceleration given initial time initial velocity final time and final velocity a common way to describe acceleration is to express it in multiples of g earth s gravitational acceleration if a dragster accelerates at a rate of 39 2 m s 2 how many g s does the driver experience acceleration is a vector in the same direction as the change in velocity Δv since velocity is a vector it can change either in magnitude or in direction acceleration is therefore a change in either speed or direction or both 1 cars deceleration 1 1 gs 3 4 2 star trek discovery episode the vulcan hello what is the acceleration in m s 2 of the plane if the plane started from rest and took 45 seconds to take off solution the initial velocity is 0 from rest and the final velocity is 300 km h take off a rocket ship starts from rest and turns on its forward booster rockets causing it to have a constant acceleration of 4 m s 2 rightward after 3 s what will be the velocity of the rocket ship answer using a coordinate system where rightward is positive a simple accelerometer consists of an object immersed in a fluid such as water consider a sealed jar that is filled with water a cork attached to the lid by a string can serve as an accelerometer simple problems on speed velocity and acceleration with descriptive answers are presented for the ap physics 1 exam and college students in each solution you can find a brief tutorial speed and velocity problems acceleration is a vector quantity because it has both a magnitude and direction acceleration is expressed in metres per second squared since acceleration is defined as the rate of change of velocity the following are the different types of acceleration important questions on acceleration acceleration is a vector that points in the same direction as the change in velocity though it may not always be in the direction of motion because acceleration is velocity in m s divided by time in s we can derive a graph of acceleration from a graph of an object s speed or position acceleration is the rate of change of velocity with time since velocity is a vector this definition means acceleration is also a vector when it comes to vectors direction matters as much as size in a simple one dimensional problem like this one directions are indicated by algebraic sign the rate of change of velocity with respect to time acceleration is a vector quantity as it has both magnitude and direction it is also the second derivative of position with respect to time or it is the first derivative of velocity with respect to time the graphical clues to follow instead are the acceleration is given by the slope of the tangent to the v vs t curve or the curvature of the x vs t curve as explained in figure pageindex 2 and the velocity is given by the slope of the tangent to the x vs t curve

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the answer is that a change in motion is equivalent to a change in velocity a change in velocity means by definition that there is an acceleration newton s first law says that a net external force causes a change in motion thus we see that a net external force causes acceleration

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acceleration a is the change in velocity Δv over the change in time Δt represented by the equation a Δv Δt this allows you to measure how fast velocity changes in meters per second squared m s 2

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an airplane lands on a runway traveling east describe its acceleration answer if we take east to be positive then the airplane has negative acceleration as it is accelerating toward the west it is also decelerating its acceleration is opposite in direction to its velocity

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we can describe acceleration as the change in velocity over time and we can use the shorthand equation a Δ v Δ t to represent this relationship where a is the average acceleration v is velocity and t is time the Δ is a greek symbol that means change

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a common way to describe acceleration is to express it in multiples of g earth s gravitational acceleration if a dragster accelerates at a rate of 39 2 m s 2 how many g s does the driver experience

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acceleration is a vector quantity because it has both a magnitude and direction acceleration is expressed in metres per second squared since acceleration is defined as the rate of change of velocity the following are the different types of acceleration important questions on acceleration

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acceleration is a vector that points in the same direction as the change in velocity though it may not always be in the direction of motion because acceleration is velocity in m s divided by time in s we can derive a graph of acceleration from a graph of an object s speed or position

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acceleration is the rate of change of velocity with time since velocity is a vector this definition means acceleration is also a vector when it comes to vectors direction matters as much as size in a simple one dimensional problem like this one directions are indicated by algebraic sign

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