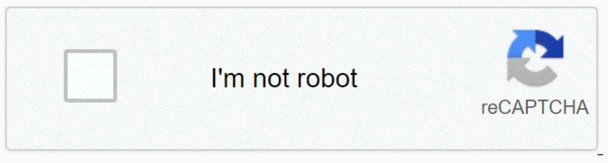

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Average speed and average velocity are same if not explain why

Before we learn about average speed and average speed, we need to know the difference between distance and movement. Distance is a scalar quantity, which usually means how much land has been covered by the object. On the other hand, displacement is a vector number, and this is the shortest possible distance between the starting and end points. Example: If a particle moves in a circle, after one revolution the distance will be the perimeter of the circle, while the displacement will be zero. Now, let's see what speed and speed really is. Speed: Speed is a scalar number, which means it has no direction. It indicates how fast the object moves. If the particle's speed is high, it means that the particle moves quickly, and if it is low, it means that the particle moves slowly. Speed: Speed is a vector number, which means it has both magnitude and direction. It indicates the speed at which the object moves or changes position. The direction of the speed vector is easy to find. Its direction is the same as the direction of the moving object. Even if the subject slows down and the speed decreases, its direction will still be the same as the direction of movement of the object Average speed Average body speed in a certain amount of time is the distance covered by the body in this time interval, divided by time. So, if the particle covers a certain distance s by time \(t_1\) to \(t_2\), the average body speed is :\(v_{av}\) = \(\frac{s}{t_{2} - t_{1}} \) In general, average speed formula: \(Average ~Speed\) = \(\frac{Total~ Distance}{Total ~Time}\) Now let's look at some examples to easily understand this concept 1.) Travelling from Pune to Nagpur , Rahul rode his bike for 2 hours at 60km/h and 3 hours at 70km/h. Sol 1) We know that, Distance = Speed × Time So, in 2 hours, distance covered = 2 × 60 = 120 km in the next 3 hours, distance covered = 3 × 70 = 210 km Total distance covered = 120 + 210 = 330 km Total time = 2 + 3 = 5 hours Average. Speed = \(\frac{Total\;d istance\;covered}{Time\;taken}\) Average speed = 330/5 = 66 kmph Average speed Average body speed in a given period of time is given as a body displacement in this time divided by time. So if a particle covers a specific offset \(\overrightarrow{AB}\) for \(t_1\) to \(t_2\), the average particle speed is \(\overrightarrow{v_{av}}\) =\(\frac{\overrightarrow{AB}}{t_{2} - t_{1}} \) In general, formula: \(Average~ Speed \)= \(\frac{Total~ Displacement}{Total~ Time}\) Understand the average speed of the concept through the examples below. 1) Calculate the average speed with a certain period of time a person if he moves 7 m for 4 sec and 18 m in 6 sec along the x axis? Sol) Initial distance passed by man, xi = 7 m, Final drove, xf = 18 m, Initial period of time ti = 4 sec, last time tf = 6 sec, Average Speed Vav = \(\frac{x_{i}-x_{f}}{t_{f}-t_{i}}= \frac{18-7}{6-4}= \frac{11}{2}\) = 5.5 m/sec. To learn more about speed and speed, download BYJU'S- The Learning app. To know about average speed and average speed, first we need to know some of the timing and their meaning. The distance that drove - The distance that drove, as the name clearly says, is the total distance that drove the object. The time taken is the time made by the object to move a given distance. Displacement - Offset is the shortest distance between the starting point where the object was and the end point where the object ended up. Speed - Speed - is the distance that the object is eating in the unit time. Speed is a scalar number. This means that it has no specified direction. Speed refers to how fast the object moves, or, in fact, the speed at which the distance is covered. Speed - Speed is a total shift of the object in a given direction in the unit time. Speed is a vector number. This means that it has the specified direction. The speed refers to the time indicator of the object's offset. Imagine a man walking some distance before returning to his original position. Since the speed of movement is the speed of movement, this movement leads to zero speed. If a person wants to maximize his speed, he should be forced out of his original position as much as possible. Since speed is a vector number, when assessing it, we must monitor the direction. The main difference between speed and speed is that the speed does not take into account the direction, because it is a scalar number, and the speed depends on the distance traveled, while the speed is a vector number that takes into account the direction, and the speed depends on the displacement. The average speed of the average speed of any object is the total distance that this object travels, divided by the total expired time to cover this distance. The average speed of an object tells you about the average speed at which it will cover the distance, meaning the object has a speed of 30 km/h, its position will change by an average of 30 km every hour. The average speed is a rate that is the number divided by time to get that number. SI unit speed is meters per second. The average speed is calculated by the formula S=d/t, where S equals the average speed, d equals the total distance and t equals the total time. Problems:1). The car drives at a distance of 70 km in 2 hours. What is the average speed? Answer: average speed = distance/timeTeropor, the average speed of the car is 70 km /2 hours = 35km/h2). A person can walk at a speed of 1.5 meters/second. How far will he walk in 4 minutes? Answer: average speed = distance / timeDistandation = Speed (time)Distance = 1.5(4) (60)Distance = 360 meters.3. Train rides in a straight line at a constant speed 60km/h at a certain distance d and then drive another distance equal to 2d in the same direction at a constant speed of 80km/h in the same direction as before. a) What is the average speed of the train throughout the journey? Solution a) T1 time to cover distance d at a speed of 60 km/h is given t1 = d / 60The time t2 to cover a distance of 2d at a speed of 80 km/ h is given t2 = 2d / 80Average Speed = distance / time = (d + 2d) / (d/60) + (2d/80) = 3d / (3d / (2d / (100)80d + 2d×60)/ (60×80)= 3 d/(200d/4800) = 3d (4800)/200d = 72 km/hAverage VelocityAverage the speed of an object can be defined as offset as to the starting position divided by time. In other words, it's the speed at which an object makes a shift over time. Like the average speed, the SI unit is meters per second. The average speed may also say that the ratio of the total movement of an object to the total time for this action will occur. The direction of average speed is the direction of displacement. Even if the speed of the object fluctuates and its value changes, its direction will still be the same as the direction of displacement. The average speed is always less than or equal to the average speed, because displacement is always less than or equal to the distance covered. The average speed is calculated by the formula V =D/t, where V equals the average speed, D equals the total displacement and t equals the total time. Problems:1. The truck driver drives 20km down the road in 5 minutes. He then turns back and drives 12km back down the road in 3 minutes. What is its average speed? Solution: V = D/tV = (20 – 12)/ (5+3)V = 8/8V = 1 kilometer / minute2. The boy walks 10 km to the east in 2 hours, followed by 2.5 km to the west in 1 hour. Calculate this boy's overall average speed? Solution: V = D/tV = (10 -2.5)/2+1V = 7.5/3V = 2.5 km / hr3. Calculate the average speed with a certain period of time a person if he moves 7 m in 4 s and 18 m in 6 s along the x-axis? Solution: The initial distance travelled by a person, xi = 7 m, the final distance drove, xf = 18 m,Initial time period ti = 4 s,Final time interval tf = 6 s,Average speed V = xi − xf / ti − tf = 18−7 / 6−4 = 11 / 2 = 5.5 m / s.Differences and similarities between average speed and average speed— Both of these terms are average by some length of time. Si units and other standard units of measurement of both average speed and average speed are the same. The formula used to calculate average speed and average speed is virtually the same, v=D/t, s=d/t, with only a small difference to mention in the first case. Differences - The average speed is scalar and does not depend on the presence or absence of direction, while the average speed, being a vector, needs direction. Average speed distance, i.e. the total length travelling during measurement, while the average speed takes offset, i.e. the direct distance from the original position to the final position. Problems associated with both average speed and average speed1. The car drives in a straight road east at 120 meters in 5 seconds, then goes west at 60 meters in 1 second. Determine the average speed and average speed. Solution:Distance = 120 meters + 60 meters = 180 metersOzhmizh = 120 meters - 60 meters = 60 meters to the east. Expired time = 5 seconds + 1 second = 6 seconds. Average speed = Elm distance / time = 180 meters / 6 seconds = 30 meters / second. Average speed = Displacement / elusive time = 60 meters / 6 seconds = 10 meters / second.2. The runner runs along a rectangle with a length of = 50 meters and a width = 20 meters. He travels through the rectangle twice, finally running back to the starting point. If the total time it takes to run along the track is 100 seconds, determine the average speed and average speed. Solution:The circumference of the rectangle, which is at a distance, drove in one round = 2(50 meters) + 2(20 meters) = 100 meters + 40 meters = 140 meters. Passes around the rectangle twice = 2(140 meters) = 280 meters. Distance = 280 meters. Displacement = 0 meters. (Since the runner returned to the starting point) The average speed is equal to the distance/time elk = 280 meters / 100 seconds = 2.8 meters/second. The average speed is equal to moving / expired time = 0 / 100 seconds = 0.3. The man begins to walk from a point in a circular field with a radius of 0.5 km and after 1 hour finds himself at the same point where he initially started. (a) What is the average speed for the entire journey he has travelled? What is the average speed of this man for the same? Solution: a) If this man walks through a circular field and returns to the same point, he covered a distance equal to the circumference of the circle. So the average speed he drove = Distance / time = circumference / time = Pi (0.5) (2) / 1 hour = 3.14 km/h (approx.) b) If he walks in a circle and returns to the same point where he started in a circle, then changing his position is zero. Since changing its position is zero, the offset is also zero. This means that the average speed is also zero. Zero.