

PHYSICS

Finish Interactive Physics: RelativeVelDirections (Bandit on Train 1-4)

Examine the 5 other files in the USERS:PHYSICS:Relative Velocity Folder and write observations.

Do the online Java file with RELATIVE WEB directions.

HW: Read about Special Relativity 66,67 and 110,111 in text.

SPEEDY QUESTIONS:

2. An airplane makes a straight back and forth trip, always at the same airspeed, between two cities. If it encounters a mild steady tailwind going, and the same steady headwind returning, will the round trip take more, less, or the same time as with no wind?



10. Two bicyclists travel at a speed of 10 km/hr towards each other, starting 20 km apart. At the moment they start, a bumblebee starts flying from one bike to the other at 25 km/hr. It goes from the front wheel of one bike to the other front wheel, instantly turning around and going the other way to touch the front wheel of the first bike. It keeps repeating this back and forth trip (with the distance getting less each time) until the bikes meet and ** squish *** the unfortunate bee between the front wheels. What was the total distance that the poor bee traveled, from the start of its journey, when the bikes were 20 km apart to its hapless end? (This can either be very easy, or very simple, depending on your approach)



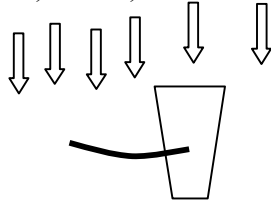
11. Dr. Pisani exercises his dog “Ssam” on a 15 minute walk. The good doctor walks in a straight line and throws a stick that Ssam chases and retrieves. To give the doggy the most exercise and keep him running for the longest time, which way (front, back, side, other) should he throw the stick?



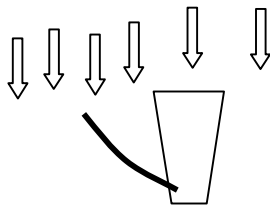
12. Suppose a streetcar is on St.Charles Street in New Orleans, and approaching Canal Street 12 feet away, at 144 inches per second. A person in the streetcar is facing forward and walking forward with a speed of 36 inches per second relative to the seats and things in the car. The person is also eating a grinder (that’s like a sub or hoagie!) sandwich which is entering his mouth at 2 inches per second (he eats fast). An ant on the sandwich is running to the end of the sandwich away from the person’s mouth, traveling at 1 inch per second.

Now the question is: How fast is the ant approaching Canal Street 12 feet away? (two answers make sense, find both!)

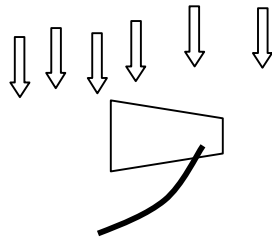
32. Everyone loves a sailboat, especially on a windy day. Suppose you are sailing directly downwind with your sails full in a 20 mph wind. Then the maximum water speed you could hope to attain would be: a) 20? B) between 20 and 40mph, C) no limit!.... Why?



33. You are again sailing downwind, and you pull your sail in so that it no longer makes a 90 degree angle with the keel of the boat. What affect will this have on the speed of the boat? Why?



34. Keeping the angle of sail relative to the boat the same as in the last question, suppose you now direct your boat so that it sails directly across the wind, rather than with the wind. Will you sail faster or slower than before?



36. Think about the previous three questions. For the four boats shown, note the orientation of the sails with respect to both wind and keel direction. Which of these boats moves forwards with greatest speed?

