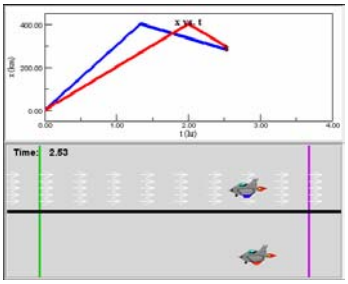
Worksheet for Exploration 9.5: Two Airplanes with Different Land Speeds



Two airplanes (not shown to scale) travel the same round-trip distance between two cities **(position is given in kilometers and time is given in hours)**. Both airplanes have the same air speed (200 km/hr), but one airplane (the top airplane with the **blue** wingtip) travels faster or slower relative to the ground because it is subject to a headwind and tailwind. *A positive wind velocity means a tailwind on the outbound part of the trip and a headwind on the inbound part of the trip.* The wind velocity can be changed by entering a value ($-199 < v_{wind} < 199$) in the text box and registering the value. Restart.

a. ***Before*** entering a non-zero value in the text box, determine which airplane will reach its destination first if the top (**blue**) airplane is subject to a head/tail wind.

b. Once you have made your determination, play the animation to see if you were right.
   i. What headwind did you use, and which plane wins?

c. If you were incorrect, can you now see why you were incorrect? Explain.
   i. It may help to make a plot of the speed vs. time for each plane.