

Working With “Distance” Problems

When working with Distance word problems, we need to use the formula for finding distance to make the work easier to set up and solve. The Distance formula is:

$$D = rt$$

“Distance” is equal to the “rate” multiplied by the “time.”

We want to set up a chart that can organize the information given in the word problem. I use the first column to list the mode of transportation being used, i.e., jet, plane, boat, etc. It helps to keep the information orderly.

	Rate	Time	=	Distance

Based on the information given in the word problem, we can complete the chart. Here is the word problem:

A private airplane leaves Midway Airport and flies due east at a speed of 180 km/h. Two hours later, a jet leaves Midway and flies due east at a speed of 900 km/h. How far from the airport will the jet overtake the private plane?

Let’s fill in the chart with what is given in the problem.

	Rate	Time	=	Distance
Airplane	180			
Jet	900			

We do not know at what time the airplane left the airport, so we need to let x represent the time. The jet left “two hours later” so his time is two hours “less” than the airplane.

	Rate	Time	=	Distance
Airplane	180	x		
Jet	900	$x - 2$		

Since rate times time is equal to the distance, we multiply across to find the “distance.”

	Rate	Time	=	Distance
Airplane	180	x		$180x$
Jet	900	$x - 2$		$900(x - 2)$

We are not given the total distance that they flew, that is what we have to find. To create the equation that is needed to solve the problem, you need to set the distance of the airplane and the distance of the jet equal to each other to solve. The equation is:

$$180x = 900(x - 2)$$

Now we can solve the problem.

$$180x = 900(x - 2)$$

$$180x = 900x - 1800$$

$$-720x = -1800$$

$$x = 2.5$$

What did we find? We find the "time" in the problem. The problem is asking us to find the distance the distance from the airport that the jet overtakes the airplane. We need to plug the information back in for x in the chart and solve to find the distance.

	Rate	Time	=	Distance
Airplane	180	2.5		450
Jet	900	2.5 - 2		450

The jet overtakes the airplane 450 miles from the airport. The distances will be equal to each other. If they are not equal to each other, something went wrong and you need to look over the problem again.