Review Exercise Set 17

Exercise 1: If Gerald was able to drive 200 miles in just 2.5 hours, what was his average speed during the trip?

Exercise 2: If a parakeet can fly at a rate of 25 miles per hour, how far will it have traveled after 1.5 hours?

Exercise 3: Two cars start out at the same time and place but travel in opposite directions. Car A is traveling 12 mph faster than car B. After 4 hours they are 528 miles apart. How fast is each car traveling? (Hint: Since you are dealing with more than one car, start by setting up the information in a table like the one below)

	Rate (r)	*	Time (t)	=	Distance (d)
Car A		*		=	
Car B		*		=	
		*		=	

Exercise 4: Two planes leave an airport at 10:00am. One plane if flying west at 375 km/h and the other plane is flying east at 450 km/h. At what time will the planes be 2475 km apart? (Hint: Start by setting up the information in a table like the one below)

	Rate (r)	*	Time (t)	=	Distance (d)
Eastbound plane		*		=	
Westbound plane		*		=	
		*		=	

Exercise 5: Jon was traveling at 75mph and overtakes Roxanne who was traveling at 62mph. If Roxanne had an 1.5-hour head start, how far from their starting point does Jon overtake Roxanne? (Hint: Start by setting up the information in a table like the one below)

	Rate (r)	*	Time (t)	=	Distance (d)
Jon		*		=	
Roxanne		*		=	
		*		=	

Review Exercise Set 17 Answer Key

Exercise 1: If Gerald was able to drive 200 miles in just 2.5 hours, what was his average speed during the trip?

Distance (D) = 200 miles
Time (T) = 2.5 hours
Rate (R) = x

D = R * T
200 miles = x * 2.5 hours
200 miles ÷ 2.5 hours = (x * 2.5 hours) ÷ 2.5 hours
80 mph = x

Gerald's average speed was 80 miles per hour.

Exercise 2: If a parakeet can fly at a rate of 25 miles per hour, how far will it have traveled after 1.5 hours?

R = 25 mph
T = 1.5 hours
D = x

D = R * T
x = 25 mph * 1.5 hours
x = 37.5 miles

The parakeet would have covered a distance of 37.5 miles.

Exercise 3: Two cars start out at the same time and place but travel in opposite directions. Car A is traveling 12 mph faster than car B. After 4 hours they are 528 miles apart. How fast is each car traveling? (Hint: Since you are dealing with more than one car, start by setting up the information in a table like the one below)

Let x equal the rate of car B since the rate of car A is defined in terms of car B's rate. Since they started at the same time, the time will be the same for each car.

	Rate (r)	*	Time (t)	=	Distance (d)
Car A	x + 12	*	4	=	4(x + 12)
Car B	x	*	4	=	4(x)
		*		=	528

Now, we can setup the equation using the distance column. We were total that the cars were traveling in opposite directions so the distance between them would be the sum of each car's distance.

Exercise 3 (Continued):

$4(x + 12) + 4(x) = 528$
$4x + 48 + 4x = 528$
$8x + 48 = 528$
$8x + 48 - 48 = 528 - 48$
$8x = 480$
$8x \div 8 = 480 \div 8$
$x = 60$

$x + 12 = 60 + 12 = 72$

Car B was traveling at a rate of 60 mph and car A was traveling at a rate of 72 mph.

Exercise 4: Two planes leave an airport at 10:00am. One plane if flying west at 375 km/h and the other plane is flying east at 450 km/h. At what time will the planes be 2475 km apart?(Hint: Start by setting up the information in a table like the one below)

Since both planes left at the same time the time for each plane will be the same, but we do not know what it is so we will let x be the time.

	Rate (r)	*	Time (t)	=	Distance (d)
Eastbound plane	450	*	x	=	450(x)
Westbound plane	375	*	x	=	375(x)
		*		=	2475

Now, setup the equation using the distance column. Like exercise 3, the planes are traveling in opposite directions so the distance between the planes would be the sum of each plane's distance.

$450(x) + 375(x) = 2475$
$450x + 375x = 2475$
$825x = 2475$
$825x \div 825 = 2475 \div 825$
$x = 3$

It will take the planes 3 hours in order to be 2475 km apart. However, be careful because this is not the answer the question wants. We were asked to find at what time the planes will be 2475 km apart. Therefore, we must add the 3 hours to their initial takeoff time of 10:00 am.

10:00 am + 3 hours = 1:00 pm

The correct answer would be 1:00 pm.

Exercise 5: Jon was traveling at 75mph and overtakes Roxanne who was traveling at 62mph. If Roxanne had an 1.5-hour head start, how far from their starting point does Jon overtake Roxanne? (Hint: Start by setting up the information in a table like the one below)

In this problem, we are told that Roxanne had an 1.5 hour head start. Therefore, her time must be 1.5 more than Jon's. So let x equal Jon's time and x + 1.5 equal Roxanne's time.

	Rate (r)	*	Time (t)	=	Distance (d)
Jon	75	*	x	=	75(x)
Roxanne	62	*	x + 1.5	=	62(x + 1.5)
		*		=	0

Now, to setup the equation. We are asked to find how far from their starting point does Jon overtake Roxanne. At the point where Jon begins to overtake Roxanne the distance between them would be zero. Unlike the other exercises, in this one they are traveling in the same direction so we must subtract their distances instead of adding them.

$$75(x) - 62(x + 1.5) = 0$$
$$75x - 62x - 93 = 0$$
$$13x - 93 = 0$$
$$13x - 93 + 93 = 0 + 93$$
$$13x = 93$$
$$13x \div 13 = 93 \div 13$$
$$x = 7.1538$$

It will take Jon approximately 7.1538 hours to catch up to Roxanne. Now that we know his time we can figure out the distance traveled.

$$75x = 75(7.1538) = 536.535$$

The distance traveled before Jon overtakes Roxanne is approximately 536.535 miles.