ACADEMIC SUPPORT CENTER
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Word Problem

Distance, Time, and Rate

Suzie and Brad are meeting in Orlando for the weekend. Suzie drives 320 miles in the same amount of time that Brad drives 270 miles. If Suzie's rate of speed is 10 miles per hour more than Brad's, and they drive for the same amount of time, at what speed is Suzie driving?

Step1: Set it up
Determine what type of problem it is and what formula applies.

d = r·t ←

It's a distance/rate/time problem. Enter both Suzie and Brad's information into the distance formula:

(Distance = Rate × Time)

Suzie's Information

Distance = rate × time

(320) = (r + 10)(t)

Brad's Information

Distance = rate × time

(270) = (r)(t)

Suzie's rate of speed is 10mph more than Brad's

Suzie's and Brad's times are the same.

Brad's rate of speed is unknown. Assign "r' as his rate of speed.

We now have a system of two equations:

$320 = (r+10)\cdot t$

$270 = r\cdot t$

Step 2: Decide which method to use (Should you use elimination or the substitution method?)
Use the substitution method in this case because it would be easier than the elimination method.

Suzie's time

$$t = \frac{d}{r}$$

$$t = \frac{320}{r+10}$$

Brad's time

$$t = \frac{d}{r}$$

$$t = \frac{270}{r}$$

Word Problem

Distance, Time, and Rate (continued)

Step 3: Solve the problem

Since Suzie and Brad's times are the same, we will set the two times equal to each other, and then solve for "r". Suzie's rate will be whatever "r" is, plus 10.

Suzie's time = Brad's time

$$\frac{320}{r+10} = \frac{270}{r}$$

Multiply both sides of the equation by $(r+10)(r)$ to remove the denominators and get the equation:

$$\begin{aligned} 320r &= 270(r+10) \\ 320r &= 270r + 2700 \\ 50r &= 2700 \\ r &= \frac{2700}{50} = 54 mph \end{aligned}$$

Add 10 to Brad's rate to get Suzie's rate

$$r+10 = 54+10 = 64 mph$$

Brad's rate = 54 mph

Suzie's rate = 64 mph

Some students would solve this by putting the information in a chart (shown below), indicating what is unknown with a variable or a question mark. This info is used to set up one or more equations.

	Distance	Rate	Time	Distance = rate × time
Suzie's info	320	$r + 10$	t	320 = (r+10)·t
Brad's info	270	r	t	270 = r·t