

# Distance = Rate <sup>key</sup> x Time <sup>#10</sup>

The relationship between distance, rate, and time is shown in the formula...

$$D = R \cdot T$$

This means the distance you travel is equal to the product of the rate (or speed) you are going and the time you have traveled. You may recall the tables below were used in previous notes to help us learn about unit rate. We found the table on the left to have a unit rate of 25 and the table on the right to have a unit rate of 3. The "T" in the tables stands for "time" and the "D" in the tables stands for "distance." So, we can see that  $D=R \cdot T$ !

T	D
2	50
3	75
5	125
7	175
8	200

T	D
1	3
2	6
3	9
4	12
5	15

Here are some examples for us to try! Please note: Sometimes we will be looking for the distance, but in other situations, we may be asked to find the time or the rate!

1. Thomas traveled from Albany to Syracuse on Saturday. The trip took 3.5 hours and he traveled at an average rate of 62 mph. How many miles did Thomas travel?

$$D = R \cdot T$$

$$D = (62 \text{ mph}) 3.5 \text{ hr.}$$

$$(D = 217 \text{ miles})$$

$$\begin{array}{r} 62 \\ \times 3 \\ \hline 186 \end{array} \quad \begin{array}{r} 62 \\ \times .5 \\ \hline 31 \end{array}$$

$$\begin{array}{r} 186 \\ 31 \\ \hline 217 \end{array}$$

2. Nicholas took a 7 hour bicycle trip. In all, he traveled 112 miles. What was his average rate of speed in miles per hour?

$$D = R \cdot T$$

$$\frac{112 \text{ mi}}{7} = \frac{R(7)}{7}$$

$$(16 \text{ mph} = R)$$

3. Amanda and Anthony decided to travel to Europe one summer with their family. The jet flew at an average rate of 550 mph and covered 3437.5 miles. How long did the flight take?

$$D = R \cdot T$$

$$\frac{3437.5}{550} = \frac{550T}{550}$$

$$\left( \frac{1}{4} \text{ hours} = T \right)$$

4. A train left New York at 10:00 a.m. and arrived in Washington D.C. at 1:45 p.m. If the distance between the two cities is 225 miles, what was the average rate of speed of the train?

$$D = R \cdot T$$

$$225 = R \left( 3 \frac{3}{4} \right) \quad R = 60 \text{ mph}$$

$$\frac{225}{3.75} = \frac{R(3.75)}{3.75}$$

5. The Smith family drove 45 mph for three hours, and then 60 mph for another 2.5 hours. What was the total distance the Smith family traveled?

$$D = 45(3) + 60(2.5)$$

$$D = 135 + 150$$

$$D = 285 \text{ miles}$$

**Challenge Problem!!!** Solve this problem using any method you would like! (You can use a diagram, a table, a number line, an equation, or any other method that YOU can explain.) Be sure to show your work!!!

6. During their last workout, Megan ran  $2 \frac{1}{4}$  miles in 15 minutes, and her friend Katie ran  $3 \frac{3}{4}$  miles in 25 minutes. Each girl thought she was the faster runner. Based on their last run, which girl is correct?

$$D = RT$$

$$R = \frac{D}{T}$$

Megan  $\frac{2 \frac{1}{4} \text{ miles}}{15 \text{ min}}$

Katie  $\frac{3 \frac{3}{4} \text{ mi}}{25 \text{ min}}$

$$\frac{2.25}{15} = .15 \text{ miles/min}$$

$$\frac{3.75}{25} = .15 \text{ miles/min}$$

They ran at the same rate! ▽