

The previous exercise showed how we can take a pattern and extend it into the world of algebra, a world that contains symbols and conventions that may seem strange, but hopefully somewhat familiar from previous work. In the final exercise, we will tackle a larger problems to see how rates, patterns, and algebra can combine to solve a more challenging problem.

Exercise #3: A man is walking across a 300 foot long field at the same time his daughter is walking towards him from the opposite end. The man is walking at 9 feet per second and the daughter is moving at 6 feet per second. How many seconds will it take them to meet somewhere in the middle?

- (a) Draw a diagram to help keep track of where the man and his daughter are after 1 second, 2 seconds, 3 seconds, etcetera. Create a table as well that helps keep track of how far each one of them has traveled as time goes on.

Time (seconds)	Father's Distance (feet)	Daughter's Distance (feet)	Total Distance (feet)
1	9 ft	6 ft	15 ft
2	18 ft	12 ft	30 ft
5	45 ft	30 ft	75 ft
10	90 ft	60 ft	150 ft

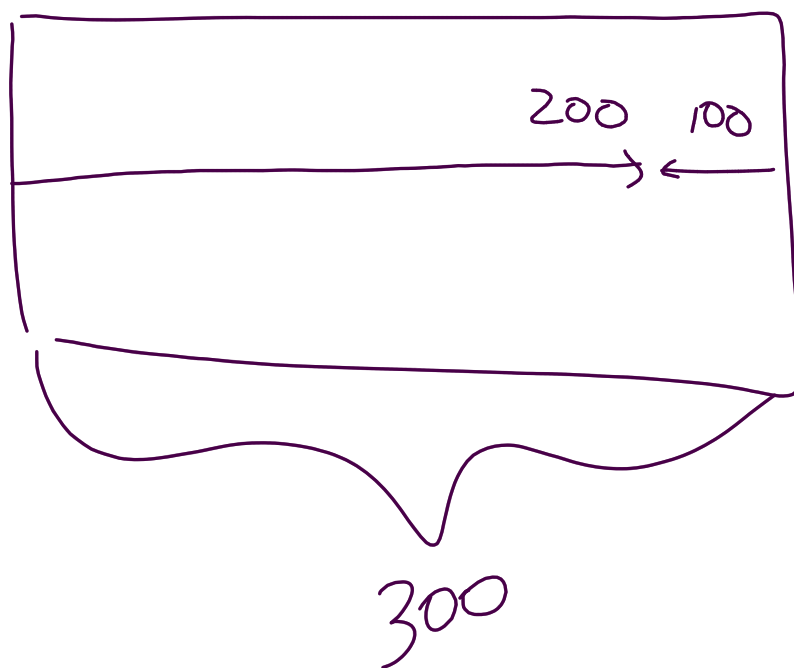
- (b) What must be true about the distances the two have traveled when they meet somewhere in the middle? State any observations that you think are relevant to modeling the problem.

The distances must total 300 ft.

- (c) Create equations similar to that in Exercise #2(b) to predict the distance the father has traveled and the distance the daughter has traveled.

- (d) Create and solve an equation to predict the exact amount of time it takes for the father and daughter to meet in the middle.

10 seconds \rightarrow 150 ft total
 $\times 2$ $\times 2$
 20 sec \rightarrow 300 ft ✓



Name: _____

Date: _____

**RATES, PATTERNS AND PROBLEM SOLVING
HOMEWORK**

1. Answer the following rate questions based on either multiplication or division. Think carefully about which is required (they will be mixed up). Show the calculation and units that you use.

(a) A child bought 4 bags of rubber bands to make into bracelets. If there are 80 rubber bands per bag, how many total rubber bands did he buy?



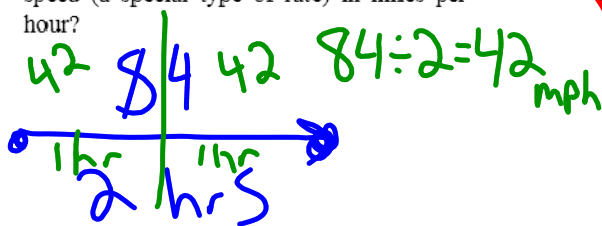
4×80
320 rubber bands

(b) Kirk has 42 pieces of candy to divide evenly between his three children. If he puts the pieces into three boxes, how many pieces of candy are there per box?

$42 \div 3 = 14$ pieces

14
14
14

(c) A car traveling on the Taconic parkway travels 84 miles in two hours. What is the cars speed (a special type of rate) in miles per hour?

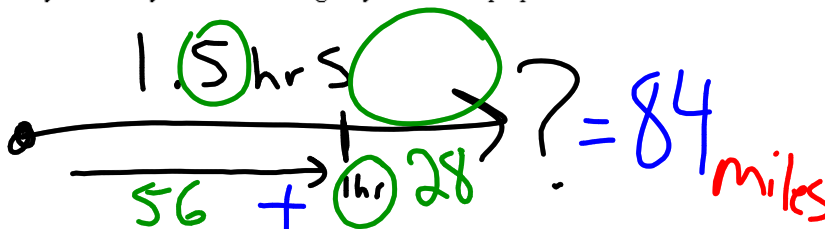
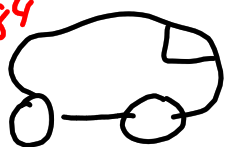


(d) A car salesperson earns a \$500 fee per car she sells. If she sells 4 cars in one day, how much money does she earn in fees?

$500 \times 4 = 2000$

2. A person driving along the road moves at a rate of 56 miles per hour driven. How far does the person drive in 1.5 hours? Show the calculation you use in your answer and give your answer proper units.

$56 \times 1.5 = 84$



3. Mr. Weiler has 32 students in his class. He wishes to place them into 8 groups of equal size. Which of the following represents the number of students per group?

- (1) 256
- (2) 2
- (3) 6
- (4) 4