

6.RP Running at a Constant Speed

Alignments to Content Standards: 6.RP.A.3 6.RP.A.3.b

Task

A runner ran 20 miles in 150 minutes. If she runs at that speed,

- How long would it take her to run 6 miles?
- How far could she run in 15 minutes?
- How fast is she running in miles per hour?
- What is her pace in minutes per mile?

IM Commentary

The purpose of this task is to give students experience in reasoning with equivalent ratios and unit rates from both sides of the ratio. This prepares for studying proportional relationships in Grade 7, and in Grade 8 for understanding that a proportional relationship can be viewed as a function in two different ways, depending on which variable is regarded as the input variable and which as the output variable.

Solutions

[Edit this solution](#)

Solution: Using a table

	A	B	C	D	E	F
Number of Minutes	150	15	7.5	30	45	60
Number of Miles	20	2	1	4	6	8

The values in column B were found by dividing both values in column A by 10. The values in column C were found by dividing both values in column B by 2. The other columns contain multiples of the values in column B.

- If we look in column E, we can see that it would take her 45 minutes to run 6 miles.
- If we look in column B, we can see that she could run 2 miles in 15 minutes.
- If we look in column F, we can see that she is running 8 miles every 60 minutes (which is 1 hour), so she is running 8 miles per hour.
- If we look in column C, we can see that her pace is 7.5 minutes per mile.

[Edit this solution](#)

Solution: Finding a unit rate

- If we divide 150 by 20, we get the unit rate for the ratio 150 minutes for every 20 miles.

$$150 \div 20 = 7.5$$

So the runner is running 7.5 minutes per mile. We can multiply this unit rate by the number of miles:

$$7.5 \frac{\text{minutes}}{\text{mile}} \times 6 \text{ miles} = 45 \text{ minutes}$$

Thus it will take her 45 minutes to run 6 miles at this pace.

- If it takes her 45 minutes to run 6 miles, it will take her $45 \div 3 = 15$ minutes to run $6 \div 3 = 2$ miles at the same pace.
- If it takes her 15 minutes to run 2 miles, it will take her $4 \times 15 = 60$ minutes to run $4 \times 2 = 8$ miles at the same pace. Since 60 minutes is 1 hour, she is running at a speed of 8 miles per hour.

d. We found her pace in minutes per miles in part (a).



6.RP Running at a Constant Speed

Typeset May 4, 2016 at 18:49:17. Licensed by Illustrative Mathematics under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License .