Lesson 8: Equivalent Ratios Defined Through the Value of a Ratio

Classwork

Exercise 1

Circle any equivalent ratios from the list below.

Ratio: $1:2$

Ratio: $5:10$

Ratio: $6:16$

Ratio: $12:32$

Find the value of the following ratios, leaving your answer as a fraction, but re-write the fraction using the largest possible unit.

Ratio: $1:2$ Value of the Ratio:

Ratio: $5:10$ Value of the Ratio:

Ratio: $6:16$ Value of the Ratio:

Ratio: $12:32$ Value of the Ratio:

What do you notice about the value of the equivalent ratios?

Exercise 2

Here is a theorem:

If two ratios are equivalent, then they have the same value.

Can you provide any counter-examples to the theorem above?

Exercise 3

Taivon is training for a duathlon, which is a race that consists of running and cycling. The cycling leg is longer than the running leg of the race, so while Taivon trains, he rides his bike more than he runs. During training, Taivon runs 4 miles for every 14 miles he rides his bike.

    a.   Identify the ratio associated with this problem and find its value.

Use the value of each ratio to solve the following.

    b.   When Taivon completed all of his training for the duathlon, the ratio of total number of miles he ran to total number of miles he cycled was $80 : 280$. Is this consistent with Taivon's training schedule? Explain why or why not.

    c.   In one training session, Taivon ran 4 miles and cycled 7 miles. Did this training session represent an equivalent ratio of the distance he ran to the distance he cycled? Explain why or why not.

Lesson Summary

The value of the ratio $A:B$ is the quotient $\frac{A}{B}$.

If two ratios are equivalent, they have the same value.

Problem Set

1. The ratio of the number of shaded sections to the number of unshaded sections is 4 to 2. What is the value of the ratio of the number of shaded pieces to the number of unshaded pieces?
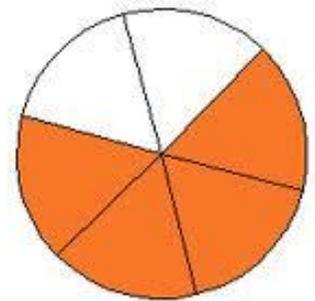
2. Use the value of the ratio to determine which ratio(s) is equivalent to $7:15$.

    a. $21:45$

    b. $14:45$

    c. $3:5$

    d. $63:135$

3. Sean was at batting practice. He swung 25 times but only hit the ball 15 times.

    a. Describe and write more than one ratio related to this situation.

    b. For each ratio you created, use the value of the ratio to express one quantity as a fraction of the other quantity.

    c. Make up a word problem that a student can solve using one of the ratios and its value.

4. Your middle school has 900 students. $\frac{1}{3}$ of the students bring their lunch instead of buying lunch at school. What is the value of the ratio of the number of students who do bring their lunch to the number of students who do not?