

Lessons 3 & 4: Equivalent Ratios

Classwork

Exercise 1

Mason and Laney ran laps to train for the long-distance running team. The ratio of the number of laps Mason ran to the number of laps Laney ran was 2 to 3.

- a. If Mason ran 4 miles, how far did Laney run? Draw a tape diagram to demonstrate how you found the answer.

- b. If Laney ran 930 meters, how far did Mason run? Draw a tape diagram to determine how you found the answer.

- c. What ratios can we say are equivalent to 2:3?

Exercise 2

Josie took a long multiple-choice, end-of-year vocabulary test. The ratio of the number of problems Josie got incorrect to the number of problems she got correct is 2:9.

- a. If Josie missed 8 questions, how many did she get correct? Draw a tape diagram to demonstrate how you found the answer.

- b. If Josie missed 20 questions, how many did she get correct? Draw a tape diagram to demonstrate how you found the answer.

- c. What ratios can we say are equivalent to 2:9?

- d. Come up with another possible ratio of the number Josie got incorrect to the number she got correct.

- e. How did you find the numbers?

- f. Describe how to create equivalent ratios.

Exercise 3

Decide whether or not each of the following pairs of ratios is equivalent.

- If the ratios are not equivalent, find a ratio that is equivalent to the first ratio.
- If the ratios are equivalent, identify the nonzero number, c , that could be used to multiply each number of the first ratio by in order to get the numbers for the second ratio.

g. 6:11 and 42:88

____ Yes, the value, c , is _____.

____ No, an equivalent ratio would be _____.

h. 0:5 and 0:20

____ Yes, the value, c , is _____.

____ No, an equivalent ratio would be _____.

Exercise 4

In a bag of mixed walnuts and cashews, the ratio of the number of walnuts to the number of cashews is 5:6. Determine the number of walnuts that are in the bag if there are 54 cashews. Use a tape diagram to support your work. Justify your answer by showing that the new ratio you created of the number of walnuts to the number of cashews is equivalent to 5:6.

Lesson Summary

Two ratios $A:B$ and $C:D$ are *equivalent ratios* if there is a nonzero number c such that $C = cA$ and $D = cB$. For example, two ratios are equivalent if they both have values that are equal.

Ratios are equivalent if there is a nonzero number that can be multiplied by both quantities in one ratio to equal the corresponding quantities in the second ratio.

Problem Set

1. Write two ratios that are equivalent to 1: 1.
2. Write two ratios that are equivalent to 3: 11.
3. Prove that 3: 8 is equivalent to 12: 32.
 - a. Use diagrams to support your answer.
 - b. Use the description of equivalent ratios to support your answer.
4. The ratio of Isabella's money to Shane's money is 3: 11. If Isabella has \$33, how much money do Shane and Isabella have together? Use diagrams to illustrate your answer.