

5.1a Ratios – Comparing Quantities

Objectives

To write two quantities with the same quantities as a ratio

To find ratios

To determine the fraction of a job completed

To find batting averages

Vocabulary

ratio – the quotient of two quantities. The relationship a/b of two quantities a and b that have the same unit of measure.



Problem of the Day

Write “3 out of 5” in math terms

Answer / Review:

$$\frac{3}{5}$$

$$3:5 = 3/5 = 3 \div 5$$

A comparison of 3 parts to 5 parts

5.1b Ratios – Comparing Quantities

New:

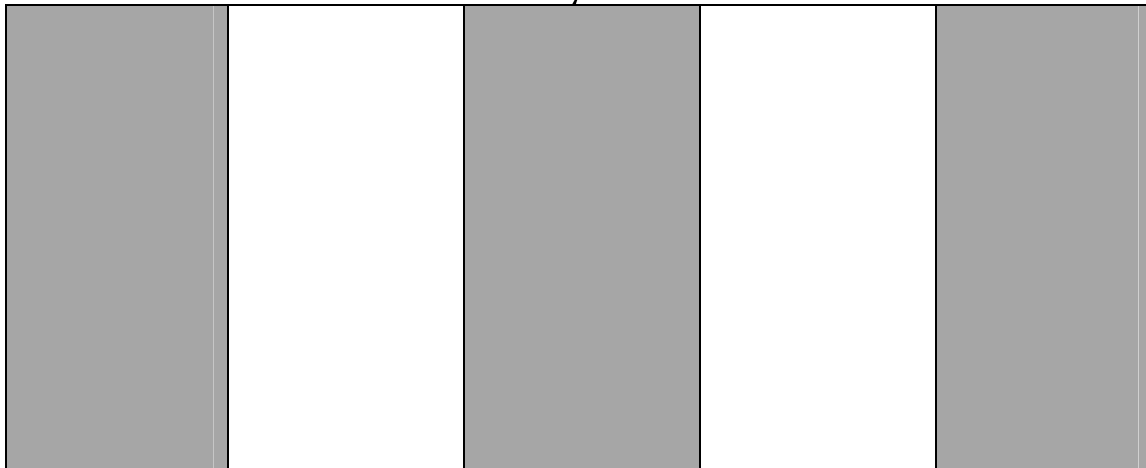
A ratio is the quotient of two quantities.

The ratio of 3 to 4 can be written in fractional notation as a fraction $\frac{3}{4}$ or in colon notation as 3:4.

Teaching Example 1:

Find the number of shaded parts to the total number of parts. All parts are the same size.

Write the ratio in two ways.



Compare the number of shaded parts to the total number of parts.

The number of shaded parts = 3

The total number of parts = 5

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So, 3 of 5 are shaded = $\frac{3}{5}$ or 3:5

Read:

three fifths or the ratio 3 to 5.

So, the ratio of the number of shaded parts to the total number of parts is $\frac{3}{5}$, or 3:5.

Definition: A ratio is a comparison of two numbers by division.

Conclusion: A fraction is a ratio.

5.1d Ratios – Comparing Quantities



Teaching Example 2:

A soccer team won 5 games and lost 4 games.
Find the ratio: wins/ total games; losses/wins



Given: Won = 5, Lost = 4,
Therefore, compute: Total = 9

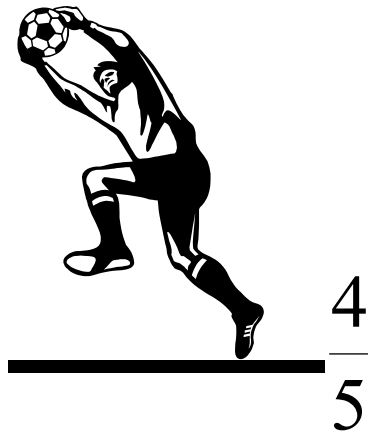
Need: wins to total

And, losses to wins

5.1e Ratios – Comparing Quantities

So, the ratio of wins/ total games is $\frac{5}{9}$ or $5:9 = \frac{5}{9}$

The ratio of losses/ wins is $\frac{4}{5}$ or $4:5$.



5.1f Ratios – Comparing Quantities

Teaching Example 3:



1 hour	1 hour	1 hour	1 hour	1 hour
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Jennifer can cut the lawn in 5 hours. What part can she cut in 2 hours?

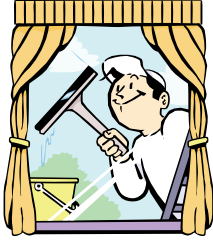
Write the ratio of the number of hours worked = $\frac{2}{5}$
To the number of total hours to do the job = 5

$$\frac{2 \text{ hours}}{5 \text{ hours}} = \frac{2}{5}$$

So, Jennifer can cut $\frac{2}{5}$ of the lawn in 2 hours.

5.1g Ratios – Comparing Quantities

Teaching Example 4:

 1 hour	1 hour	1 hour	1 hour	1 hour
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George can wash the windows in 5 hours.
What part can he wash in 1 hour? In 3 hours?
In n hours?

Write the ratio.

$$\frac{\text{\# of hours worked}}{\text{\# of hours to do the job}}$$

1 hr. worked: $\frac{1}{5}$ of the job.

3 hr. worked: $\frac{3}{5}$ of the job.

n hr. worked: $\frac{n}{5}$ of the job.

So, George can wash $\frac{1}{5}$ of the windows in 1 hour, $\frac{3}{5}$ in 3 hours, and $\frac{n}{5}$ in n hours.

5.1h Ratios – Comparing Quantities



Teaching Example 5:

Hank got 165 hits in 532 times at bat.

What was Hank's batting average?

Find the Ratio. Divide.

$$\frac{\text{\# of hits}}{\text{Total \# of times at bat}} = \frac{165}{532}$$

Carry the quotient to the thousandths. Batting averages are read without the decimal and are given without 0 before the decimal point. A batting average of 0.310 mean 310 hits per 1,000 times at bat.

$$\begin{array}{r} \underline{0.3} \\ 532 \overline{)165.0} \\ \underline{1596} \end{array} \qquad \begin{array}{r} \underline{.31} \\ 532 \overline{)165.00} \\ \underline{1596} \\ 540 \end{array} \qquad \begin{array}{r} \underline{.310} \\ 532 \overline{)165.000} \\ \underline{1596} \\ 540 \\ \underline{532} \\ 80 \end{array}$$

So, Hank's batting average was 0.310.