Ratios and Proportions

A ratio is a way to compare two quantities. A proportion is comparing two ratios.

The form of a ratio can be in line with text using a colon or written stacked with a fraction bar, in manglish…it’s pretty variable. Let’s look at the ratio of wins to losses for the Dolphins, a soccer team. They won 5 out of 8 games. 5:8 or

 . Sometimes the word “per” or “to” is used, too. For example, if there are 5 apples per package…this is a ratio, too.

Often people want to use a unit ratio. This means that the denominator is converted to one unit. If we paid $15 dollars for 3 pairs of socks, the unit ratio is $5 per pair (as in ONE pair).

Note that the first quantity mentioned is usually the numerator and the second, the denominator. Or the first quantity is to the left of the colon and the second to the right.

If Sam earns $25.75 selling 5 subscriptions to a particular magazine, what is the unit ratio per subscription?

Now proportions are just ratios linked by an equals sign. Generally one of the 4 places is an “x” and the problem is to find the unknown. If we are dividing 3 cookies among every two children, how many kids can share 15 cookies?

 Solve for x.

Sometimes you need to use the information in the ratio as a constraint. For example, if the Dolphins have a record of 5 wins to 3 losses, could they have played 24 games? Sure, any multiple of 8 will do because it is common practice to reduce ratios sometimes. They played at least 8 games, but might have played more and the reporter just canceled out the common term.

If the ratio of wins to losses is 7:5, then the team played some multiple of 7+5 = 12 games. Suppose they played 27:15…then a common practice is to divide both sides by 3 or divide 7 by 5 and report a percent win.

Unit ratios take a comparison and reduce until there is a one in the denominator. If 3 croissants cost $3.96, then the unit ratio of $1.32 per croissant.

Here are some common ratio problems:

Two faucets are dripping. Faucet A drips 2 oz. in 5 minutes. Faucet B drips 1 oz in 3 minutes. Which is dripping faster?

If 14 cookies cost $2.50 what is the cost per cookie?

Mrs. Smith’s class is having snail races. Snail A goes 5 inches in 1.2 minutes and Snail B goes 4 inches in .95 minutes. Which snail is faster?

Solutions:

Faucet A drips 2oz in 5 minutes. Faucet B 1/3. Get both fractions with a one in the numerator. A is 1 in 2.5 so it’s dripping faster than 1 in 3.

We want a unit ratio. 2.50 divided by 14 gives .17857 or about 18 cents per cookie.



Ratios per one minute. B wins