

Section 7.1 - Ratios

Goals: write and simplify ratios and use ratios to write equations and solve problems

Ratio: a comparison of two quantities by division

Example: $2/3$ or $2:3$ or 2 to 3

- the two numbers should be in the same units
- ratios should be written in simplest form

EXAMPLES:

There are 16 girls and 4 boys in a class. What is the ratio of girls to boys?

$$\frac{16}{4} = \boxed{\frac{4}{1}}$$

A salad plate is 8 inches wide. A dinner plate is 1 ft wide. What is the ratio of the salad plate's width to the dinner plate's width?

$$1 \text{ ft} = 12 \text{ in} \quad \frac{8 \text{ in}}{12 \text{ in}} = \boxed{\frac{2}{3}}$$

Solving a Problem with Ratios

The horticulture club is planning to sell potted tulips and daffodils as a fundraiser. The plan to buy 120 pots of flowers. The ratio of tulip pots to daffodil pots will be 2/3. How many of each type of flower should they buy?

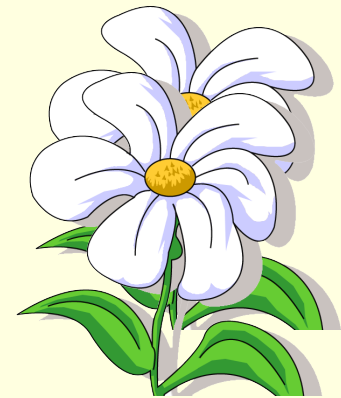
x is standing for the number that was divided out when the ratio was simplified

$$2x + 3x = 120$$

$$5x = 120$$

$$x = 24$$

$$\begin{aligned} \text{Tulips} &= 2(24) = 48 \\ \text{Daffodils} &= 3(24) = 72 \end{aligned}$$



Extended Ratios

Extended Ratio: a ratio that compares 3 or more numbers

The lengths of the sides of a triangle are in the extended ratio 3: 5: 6. The perimeter of the triangle is 98 inches. What are the actual lengths of the sides?

$$3x + 5x + 6x = 98$$

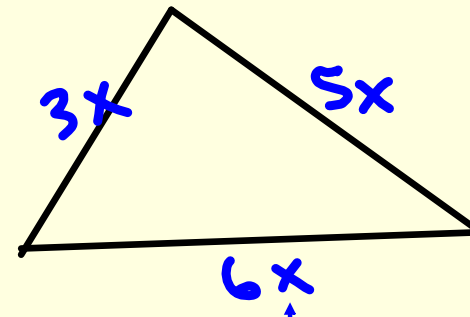
$$14x = 98$$

$$x = 7$$

Sides $3(7) = 21$

$$5(7) = 35$$

$$6(7) = 42$$



x stands for the number that was divided out when the ratio was simplified

Try this one on your own...

The ratio of country songs to rock songs on a playlist is 5:3. If there are 96 songs total, how many of them are country?



$$5x + 3x = 96$$

$$\frac{8x}{8} = \frac{96}{8}$$

$$x = 12$$

$$\text{Country songs} = 5(12) = \boxed{60 \text{ songs}}$$



Assignment:

Concept 17 Worksheet

(1-9)

WRITING RATIOS AND SOLVING RATIO PROBLEMS

The girls' soccer team won 10 games and lost 2, and the boys' soccer team won 12 games and lost 3. Write each ratio in simplest form.

1. What is the ratio of the girls' wins to their losses? $10/2 = 5/1$
2. What is the ratio of the boys' wins to their losses?
3. What is the ratio of the girls' wins to the total number of games played?
4. What is the ratio of the boys' wins to the total number of games played?
5. Which team had the greater winning ratio?

Answer each question by writing an solving an equation using the given ratio.

6. A baseball team played 154 regular season games. The ratio of the number of games they won to the number of games they lost was 5:2. How many games did they win? How many did they lose?

$$5x + 2x = 154$$

Wins = _____

Loses = _____

8. The lengths of the sides of a triangle are in the extended ratio 6:7:9. The perimeter of the triangle is 88 cm. What are the lengths of the sides?

Side 1 = _____

Side 2 = _____

Side3 = _____

7. The measure of two supplementary angles are in the ratio of 5:7. What is the measure of the larger angle?

Larger angle = _____

9. The measures of the angles of a triangle are in the extended ratio 4:3:2. What is the measure of the largest angle?

Largest angle = _____

show
work!