

Rate, Ratio, Proportion



What is the ratio of cats to mice?



Number of Cats: 3

Number of Mice: 6



Express the ratio as a fraction: $\frac{3}{6}$

Express the ratio in words: 3 to 6



Express the ratio with a colon: 3:6

What is a ratio?

Example:
students
computers

There are 300 computers and 1200
in our school. What is the ratio of
to students?

A **ratio** is a
comparison
of two
quantities.

Express the ratio in words: **300 to
1200**

Express the ratio with a colon: **300 : 1200**

Express the ratio as a fraction: $\frac{300}{1200}$

**How many students are there for one
computer?**



What is an Equivalent Ratio?

If we refer to the previous example we can say the same thing in two different ways:

1. There are 300 computers for 1200 students

OR

2. There is 1 computer for every 4 students

Express the ratio as a fraction:

$$\frac{300}{1200}$$

Bring the fraction to lowest terms:

$$\frac{\cancel{300}}{\cancel{1200}} = \frac{1}{4}$$

Equivalent ratios make the same comparison.



Practice With Equivalent Ratios

Find an equivalent ratio by dividing:



$$\frac{30}{90} = \frac{30 \div 30}{90 \div 30} = \frac{1}{3}$$

→ Divide by 30



$$\frac{15}{12} = \frac{15 \div 3}{12 \div 3} = \frac{5}{4}$$

→ Divide by 3



$$\frac{125}{300} = \frac{125 \div 25}{300 \div 25} = \frac{5}{12}$$

→ Divide by 25



Practice With Equivalent Ratios

Find an equivalent ratio by multiplying:

4

$$\frac{10}{4} = \frac{10 \times 5}{4 \times 5} = \frac{50}{20}$$

→ Multiply by 5

5

$$\frac{7}{3} = \frac{7 \times 12}{3 \times 12} = \frac{84}{36}$$

→ Multiply by 12

6

$$\frac{11}{20} = \frac{11 \times 6}{20 \times 6} = \frac{66}{120}$$

→ Multiply by 6



Nice Job!!

**John and Mary make strawberry punch.
Whose punch has a stronger strawberry
taste?**

**John:
2 parts
concentrate
4 parts water**

→ **Write the ratio**

$$\frac{2}{4}$$

→ **Divide 2 by 4**

$$\frac{2}{4} = 0.5$$

→ **Write as a
percentage**

$$0.5 \times 100 = 50 \% \text{ concentrate}$$

**Mary:
3 parts
concentrate
5 parts water**

→ **Write the ratio**

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

→ **Divide 3 by 5**

$$\frac{3}{5} = 0.6$$

→ **Write as a
percentage**

$$0.6 \times 100 = 60 \% \text{ concentrate}$$

stronger strawberry taste



Ratio and Proportion

Example 1 A recipe that serves 4 people uses 5 potatoes.
How many potatoes are needed to serve 28 people?

1

Let x be the number of potatoes required to serve 28 people.

2

Since the recipe is the same, we have two equivalent ratios.

of people:
of potatoes:

$$\frac{4}{5} = \frac{28}{x}$$

3

Cross multiply

$$4x = 5(28)$$
$$4x = 140$$

4

Divide by 4 to find x

$$\frac{4x}{4} = \frac{140}{4}$$

$x = 35$ potatoes



Example 2

A floral design uses two red roses for every three yellow roses. How many red roses will be in a garden that contains 500 roses in total?

1

Let r be the number of red roses.
Let y be the number of yellow roses.

2

Write the ratio: $r : y = 2 : 3$

3

One design requires $2 + 3 = 5$ roses in total

4

How many designs are there in the garden?

5

$500 \div 5 = 100$ designs

How many red roses are in the garden?

100 designs x 2 red roses per design

= 200 red roses

