

0.1 Ratios & Proportions Notes

A ratio is a relationship between two things
showing how much bigger one is than another

How to write ratios?

Part to Part



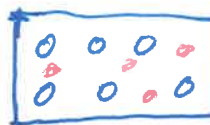
circles: dots
 (to)

$$6 : 4$$

$$\div 2 \quad \div 2$$

$$3 : 2$$

Part to Whole



circles : total dots : total

$$6 : 10$$

$$4 : 10$$

$$3 : 5$$

$$2 : 5$$

Fraction

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

$$\frac{2}{5}$$

Equivalent ratios are

2 ratios that show the same relationship
(they are equal)

How to find an equivalent ratio.

a. $\frac{2}{3} = \frac{10}{15}$
 $\times 5$

c. $\frac{3}{2} = \frac{9}{6}$
 $\div 2$

$$3 \times 6 \div 9 = 2$$

b. $\frac{2}{4} = \frac{1}{2}$

d. $\frac{2}{3} = \frac{24}{36}$

Many problems in math can be solved using proportions!

A proportion is an equation with 2 equal ratios or rates.
Usually written in fraction form.

Setting up and Solving a proportion

$$\frac{\quad}{\quad} = \frac{\quad}{\quad}$$

Example:

You can go 294 km in 3 hours. How far can you go in 1 hour?

$$\frac{294 \text{ km}}{3 \text{ h}} = \frac{x}{1 \text{ h}}$$

$$x = 294 \times 1 \div 3 = 98 \text{ km in one hour}$$

Show you know:

1. The Crayola crayon company can make 2400 crayons in 4 minutes. How many crayons can they make in 15 minutes?

$$\frac{2400 \text{ crayons}}{4 \text{ min}} = \frac{x}{15 \text{ min}}$$

$$x = 2400 \times 15 \div 4 = 9000 \text{ crayons}$$

2. If you earn \$150.00 in 12 hours, how much will you earn in if you work 40 hours?

$$\frac{\$150.00}{12 \text{ h}} = \frac{x}{40 \text{ h}}$$

$$x = 150 \times 40 \div 12 = \$500.00$$

Part to a Whole Ratio

Ex 2. Bag A contains 12 yellow chips and 18 purple chips. Bag B contains a total of 40 yellow and purple chips. The ratio of yellow to purple chips is the same in each bag. ~~disks and 6 blue disks~~. How many yellow and purple chips are in Bag B?

$$\text{Bag A} \quad 12y + 18p = 30 \text{ total}$$

$$\text{yellow} = \frac{12}{30}$$

$$\text{purple} = \frac{18}{30}$$

$$\text{Bag B} \quad \text{total } 40 \text{ chips}$$

yellow?

$$\frac{12 \text{ yellow}}{30 \text{ total}} = \frac{x \text{ yellow}}{40 \text{ total}}$$

$$x = 40 \times 12 \div 30 = 16 \text{ yellow chips}$$

purple?

$$40 \text{ total} - 16 \text{ yellow} = 24 \text{ purple}$$

