

Name:

Ratios!

Foundation	Higher (Q5 is hard)
Sarah mixed red and blue paint in a ratio of 3:5. If she used 15 Liters of blue paint, how much red paint did she use?	A mixture of water and juice is in a ratio of 1:4. If there are 20 Liters of juice, how much water is in the mixture?
The ratio of boys to girls in a class is 4:7. If there are 28 boys, how many girls are in the class?	The ratio of boys to girls in a school is 5:7. If there are 280 girls, how many boys are there in the school?
A recipe requires a ratio of 2 cups of flour to 3 cups of sugar. How much flour is needed if you have 15 cups of sugar?	There are 50 litres of water in a tub. The water flows out of the tub at a rate of 150 millilitres per second. (1 Litre = 1000 millilitres). Work out the time it takes to fully empty the tub in seconds. Try working it out in hours for a stretch.
In a bag of marbles, the ratio of red to blue marbles is 3:7. If there are 42 red marbles, how many blue marbles are there?	A shop sells bagels and breads. The ratio of the number of bagels sold to the number of loafs sold is 7:2. The shop sells a total 180 bagels and loafs in one week. Work out the number of loafs and bagels sold in that week.
A map scale indicates that 1 centimetre represents 5 kilometres. If the distance between two cities on the map is 15 centimetres, what is the actual distance in kilometres?	The ratio of the lengths of two sides of a rectangle is $k:3$, where k is a positive constant. If the shorter side has a length of 6 meters, and the difference between the lengths is equal to one-third of the length of the shorter side, what is the length of the longer side? Go on to find the value of k .

Solutions!

Foundation	Higher (Q5 is hard)
<p>Sarah mixed red and blue paint in a ratio of 3:5. If she used 15 Liters of blue paint, how much red paint did she use?</p> <p>We need to find the amount of red paint used by Sarah.</p> <p>Let x represent the amount of red paint used in Liters.</p> <p>According to the given ratio, the ratio of red to blue paint is 3:5. So, we can set up the equation:</p> $\frac{3}{5} = \frac{15}{x}$ <p>Now, let's solve for x:</p> <p>Cross-multiply:</p> $3 \times 15 = 5 \times x$ $45 = 5x$ <p>Divide by 5:</p> $x = \frac{45}{5}$ $x = 9$ <p>Therefore, Sarah used 9 Liters of red paint.</p>	<p>A mixture of water and juice is in a ratio of 1:4. If there are 20 Liters of juice, how much water is in the mixture?</p> <p>We need to find the amount of water in the mixture.</p> <p>Let x represent the amount of water in the mixture.</p> <p>According to the given ratio, the ratio of water to juice is 1:4. So, we can set up the equation:</p> $\frac{1}{4} = \frac{x}{20}$ <p>Now, let's solve for x,</p> <p>Cross-multiply:</p> $4x = 1 \times 20$ $4x = 20$ <p>Divide by 4:</p> $x = \frac{20}{4}$ $x = 5$ <p>Therefore, there are 5 Liters of water in the mixture.</p>
<p>The ratio of boys to girls in a class is 4:7. If there are 28 boys, how many girls are in the class?</p> <p>We need to find the number of girls in the class.</p> <p>Let x represent the number of girls in the class.</p> <p>According to the given ratio, the ratio of boys to girls is 4:7. So, we can set up the equation:</p> $\frac{4}{7} = \frac{28}{x}$ <p>Now, let's solve for x:</p> <p>Cross-multiply:</p> $4x = 7 \times 28$ $4x = 196$	<p>The ratio of boys to girls in a school is 5:7. If there are 280 girls, how many boys are there in the school?</p> <p>We need to find the number of boys in the school. Let x be the number of boys in the school.</p> <p>According to the given ratio, the number of boys to the number of girls is 5:7. So, we can set up the equation:</p> $\frac{5}{7} = \frac{x}{280}$ <p>Now, let's solve for x, (Cross-multiply):</p> $7x = 5 \times 280$ $7x = 1400$ <p>Divide by 7:</p>

<p>Divide by 4:</p> $x = \frac{196}{4}$ $x = 49$ <p>Therefore, there are 49 girls in the class.</p>	$x = \frac{1400}{7}$ $x = 200$ <p>Therefore, there are 200 boys in the school.</p>
<p>A recipe requires a ratio of 2 cups of flour to 3 cups of sugar. How much flour is needed if you have 15 cups of sugar?</p> <p>We need to find the amount of flour needed for 15 cups of sugar. Let x represent the amount of flour needed in cups. According to the given ratio, the ratio of flour to sugar required is 2:3. So, we can set up the equation:</p> $\frac{2}{3} = \frac{x}{15}$ <p>Now, let's solve for x: Cross-multiply:</p> $2 \times 15 = 3 \times x$ $30 = 3x$ <p>Divide by 3:</p> $x = \frac{30}{3}$ $x = 10$ <p>Therefore, you will need 10 cups of flour if you have 15 cups of sugar for the recipe.</p>	<p>There are 50 litres of water in a tub. The water flows out of the tub at a rate of 150 millilitres per second. (1 Litre = 1000 millilitres). Work out the time it takes to fully empty the tub in seconds. Try working it out in hours for a stretch.</p> <p>There are 50 litres of water in a tub, which is equal to:</p> $50 \times 1000 = 50,000 \text{ millilitres}$ <p>Let t represent the time it takes to fully empty the tub in seconds. The rate of water flow out of the tub is 150 millilitres per second. So, we can set up the equation: Rate of water flow = Volume / Time</p> $150 \text{ millilitres per second} = \frac{50,000}{t} \text{ millilitres}$ <p>Now, let's solve for t:</p> $t = \frac{50,000 \text{ millilitres}}{150 \text{ millilitres per second}}$ $t = 333.33 \text{ (2.d.p)}$ <p>To convert the time to hours, divide by 3600 seconds (since there are 60 seconds in a minute and 60 minutes in an hour):</p> $t \text{ (in hours)} = 333.33 \text{ seconds} / 3600 \text{ seconds per hour}$ $t \text{ (in hours)} \approx \mathbf{0.0926 \text{ hours}}$
<p>In a bag of marbles, the ratio of red to blue marbles is 3:7. If there are 42 red marbles, how many blue marbles are there?</p> <p>We need to find the number of blue marbles in the bag.</p> <p>Let x represent the number of blue marbles in the bag.</p>	<p>A shop sells bagels and breads. The ratio of the number of bagels sold to the number of loafs sold is 7:2. The shop sells a total 180 bagels and loafs in one week. Work out the number of loafs and bagels sold in that week.</p> <p>Let the number of bagels sold be 7x, and the number of loaves of bread sold be 2x, where x is a positive constant representing the common factor in the</p>

According to the given ratio, the ratio of red to blue marbles is 3:7. So, we can set up the equation:

$$\frac{3}{7} = \frac{42}{x}$$

Now, let's solve for x:

Cross-multiply:

$$3x = 7 \times 42$$
$$3x = 294$$

Divide by 3:

$$x = \frac{294}{3}$$
$$x = 98$$

Therefore, there are **98** blue marbles in the bag.

ratio.

According to the given ratio, the number of bagels sold to the number of loaves of bread sold is 7:2. So, we can set up the equation:

$$(7x) + (2x) = 180$$

$$9x = 180$$

Divide by 9:

$$x = \frac{180}{9}$$

$$x = 20$$

Now that we have the value of x, we can find the number of bagels and loaves of bread sold:

$$\text{Number of bagels} = 7x = 7 * (20) = \mathbf{140}$$

$$\text{Number of loaves of bread} = 2x = 2 * (20) = \mathbf{40}$$

A map scale indicates that 1 centimetre represents 5 kilometres. If the distance between two cities on the map is 15 centimetres, what is the actual distance in kilometres?

Let d represent the actual distance between the two cities in kilometres.

According to the map scale, 1 centimetre on the map represents 5 kilometres. So, we can set up the proportion:

$$\frac{1 \text{ centimeter}}{5 \text{ kilometers}} = \frac{15 \text{ centimeters}}{d \text{ kilometers}}$$

Now, let's solve for d:

The ratio of the lengths of two sides of a rectangle is k:3, where k is a positive constant. If the shorter side has a length of 6 meters, and the difference between the lengths is equal to one-third of the length of the shorter side, what is the length of the longer side? Go on to find the value of k.

Let's solve the problem step by step:

Given:

- Ratio of the lengths of two sides of the rectangle is **k:3**, where k is a positive constant.
- Length of the shorter side is 6 meters.

Let x be the length of the longer side.

According to the given ratio, the lengths of the two sides are in the **ratio k:3**. So, we can set up the equation:

$$\frac{k}{3} = \frac{6}{x}$$

Cross-multiply:

$$1 \times d = 5 \times 15$$

$$d = 75$$

Therefore, the actual distance between the two cities is **75 kilometres**

Now, let's incorporate the information about the difference between the lengths. The **difference between the lengths** is equal to **one-third of the length of the shorter side**. Therefore, we have:

$$x - 6 = \left(\frac{1}{3}\right) \times 6$$

$$x - 6 = 2$$

Now, let's solve for x:

$$x = 2 + 6$$

$$x = 8$$

Now, we can substitute the value of x to find the value of k.

$$\frac{k}{3} = \frac{6}{8}$$

$$k = 3 \times \frac{6}{8}$$

$$k = \frac{9}{4}$$

Sometimes you can get tricky questions, but you can tackle them by remembering to Always have clear working to avoid making mistakes!