Grade 7 Math, Explained

Unit 6 · Ratio and Proportion

HARDER PRACTICE QUESTIONS

Full marks 33

Write your answers on separate paper. Show your working, and write every ratio in its simplest form. Keep the terms of two ratios in the same order. The amounts on this sheet are made up for the problems.

1 Spot the errors [4]

Smriti wrote these four lines. Each has one mistake. Write each line correctly, and say what was wrong.

i. 2 hours : 30 minutes = 2 : 30 = 1 : 15

ii. Girls : boys = 3 : 5, so $\frac{3}{5}$ of the class are girls.

iii. 2, 5, 6, 16 are in proportion, because $2 \times 16 = 5 \times 6$.

iv. Rs 500 : Rs 200 = 2 : 5

2 Simplest forms [4]

Write each ratio in its simplest form.

a. $\frac{1}{2} : \frac{1}{3}$

b. 0.25 kg : 750 g

c. 1.5 m : 45 cm

d. 45 minutes : $1\frac{1}{2}$ hours

3 Whose tea is milkier? [4]

Ashish makes milk tea with 3 cups of milk to 2 cups of water. Kritika makes hers with 5 cups of milk to 4 cups of water.

i. Write each ratio of milk to water as a fraction, and say whose tea is milkier.

ii. What fraction of each tea's liquid is milk?

iii. Kritika keeps her 4 cups of water. How many more cups of milk must she add to make her tea taste just like Ashish's?

4 Sharing, backwards [4]

Two sisters, Nirjala and Swastika, share their prize money in the ratio 4 : 5. Nirjala gets Rs 600 less than Swastika.

i. How many parts of the money is Rs 600?

ii. How much was the prize money?

iii. How much does each sister get?

iv. Swastika gives Nirjala Rs 300. What is the new ratio of their money?

5 A class that changes [4]

A class of 48 has boys and girls in the ratio 7 : 5.

i. How many boys and how many girls are there?

ii. How many girls must join the class to make the ratio 1 : 1?

iii. Instead, 4 boys and 4 girls join. Is the ratio still 7 : 5? Find it.

iv. Instead, only girls join. How many must join to make the ratio of boys to girls 4 : 5?

6 A bigger photo [3]

A photo is 10 cm wide and 15 cm tall. A shop makes a bigger copy of the same shape, 24 cm wide.

i. How tall is the copy? Use a proportion.

ii. A frame is 12 cm wide and 20 cm tall. Will the photo, made bigger or smaller, fill it exactly without cutting anything off? Give a reason.

7 Four numbers, many proportions [3]

i. Using each of 3, 4, 6 and 8 once, write two different proportions. Check each with the extremes and means.

ii. Explain why 3, 4, 6 and 9 can't make a proportion in any order.

8 Make your own [3]

i. Write two quantities in different units whose ratio, in its simplest form, is 2 : 3.

ii. Write a proportion whose extremes are 2 and 15.

iii. Write a short word problem whose answer uses the ratio 3 : 5, and solve it.

9 Think: add the same to both [4]

Pratik says, "Adding the same number to both terms keeps a ratio the same, like multiplying does."

i. Start with 1 : 2. Add 1 to both terms. Is the new ratio equal to 1 : 2?

ii. Keep adding 1 to both terms: 3 : 4, 4 : 5, … What happens to the ratio as a fraction?

iii. For which ratios does adding the same number to both terms change nothing?

iv. Multiply both terms of 1 : 2 by 3. Is the ratio the same? Why does multiplying keep it, when adding doesn't?