MATHEMATICS · GRADES 7-9

Simplifying ratios

Difficulty level: Intermediate

Mathematics: Grades 7-9

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Overview of the concept

This is how you shrink a recipe, a paint mix, or a score comparison down to its simplest numbers, like turning 12 cups of flour to 4 cups of sugar into 3 to 1, so anyone can read it at a glance. A ratio in its simplest form shows the real relationship, without the big numbers getting in the way. A cook can scale it up or down for any size batch, and a painter can mix the same colour again with different amounts. Whenever you compare two quantities, the simplest ratio is the one people actually understand.



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Rule

Simplifying ratios: divide both parts of a ratio by the same number until they share no common factor but 1.

A ratio in simplest form shows the same comparison with the smallest whole numbers.

Worked examples

EXAMPLE 1

Q Simplify the ratio 12 : 18.

SOLUTION

This is a simplifying question, so start with the one rule to remember: divide both sides by the same number, the highest common factor, until nothing divides both of them.

The highest common factor of 12 and 18 is 6. Twelve divided by 6 is 2, and 18 divided by 6 is 3.

So the ratio 12 : 18 in simplest form is 2 : 3.

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EXAMPLE 2

Q Write 40 minutes to 4 hours as a simplified ratio.

SOLUTION

This is a same-units-first question, so do not divide yet. A ratio can only be simplified when both parts use the same unit.

Four hours is 4 x 60, which is 240 minutes, so the ratio is 40 : 240. Now divide both sides by their highest common factor, 40.

So the simplified ratio is 1 : 6.

Practice questions

1 Simplify the ratio 15 : 25

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2 Simplify the ratio $\frac{2}{3} : \frac{1}{6}$

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3 **Simplify the ratio 9 : 12 : 15**

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4 **A class has 8 boys and 12 girls. What is the ratio of boys to girls in simplest form?**

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5 **Write 50 cents to $2 as a simplified ratio.**

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6 A ratio in simplest form is 3 : 5. The first part is 12. What is the second part?

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7 Is 10 : 20 the same ratio as 4 : 8?

A Yes

B No

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8 Is the ratio 6 : 9 in simplest form? If not, simplify it.

- **A** No, 2 : 3
- **B** Yes
- **C** No, 3 : 2
- **D** No, 6 : 9

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9 Share $60 in the ratio 2 : 3. How much does the person with 2 parts get?

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10 A recipe uses flour and sugar in the ratio 4 : 1. How much sugar do you need with 12 cups of flour?

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ANSWER KEY

1. 3 : 5

2. 4 : 1

3. 3 : 4 : 5

4. 2 : 3

5. 1 : 4

6. 20

7. Yes

8. No, 2 : 3

9. 24

10. 3

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