MATHEMATICS · GRADES 4-6

Finding common denominators

Difficulty level: Intermediate

Mathematics: Grades 4-6

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Overview of the concept

This is how you make the pieces of two fractions the same size so you can add, subtract, or compare them fairly. Two recipes that use different measuring cups cannot be combined until their pieces match, and fractions work the same way. The common denominator is the shared size that lets you add them up. Once the pieces match, the rest is just adding whole numbers of pieces.



Rule

Common denominator: a number that both denominators divide into.

The lowest common denominator is the smallest such number, found by listing the multiples of each denominator until one appears on both lists.

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Worked examples

EXAMPLE 1

Q What common denominator works for $\frac{1}{4}$ and $\frac{1}{6}$?

SOLUTION

This is a find-the-common-denominator question. The one rule to remember is that a common denominator is a number both denominators divide into, and the smallest one is the least common multiple.

List the multiples of 4: 4, 8, 12. List the multiples of 6: 6, 12.

The first number on both lists is 12, so 12 is the common denominator. Then $\frac{1}{4}$ is $\frac{3}{12}$ and $\frac{1}{6}$ is $\frac{2}{12}$.

EXAMPLE 2

Q A recipe uses $\frac{2}{5}$ cup of flour and $\frac{1}{10}$ cup of sugar. What common denominator lets you add them?

SOLUTION

Check first whether one denominator already divides the other, because then there is nothing to list.

10 is a multiple of 5, so 10 is the common denominator.

$\frac{2}{5}$ becomes $\frac{4}{10}$, and $\frac{1}{10}$ stays as it is. When one denominator divides the other, that denominator is the common denominator.

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Practice questions

1 What common denominator would let you add $\frac{1}{2}$ and $\frac{1}{3}$?

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2 Mia eats half a pizza and Noah eats a quarter of the same pizza. What common denominator would let you add their shares?

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3 The fraction $\frac{1}{4}$ written over the denominator 12 is $\frac{?}{12}$. What is the missing numerator?

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4 Two fractions have the common denominator 12. Which pair could they be?

- **A** $\frac{1}{2}$ and $\frac{1}{3}$
- **B** $\frac{1}{4}$ and $\frac{1}{5}$
- **C** $\frac{1}{6}$ and $\frac{1}{7}$

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5 The multiples of 3 are 3, 6, 9, 12, 15. The multiples of 4 are 4, 8, 12, 16. What is the first number on both lists?

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6 What common denominator works for $\frac{1}{6}$ and $\frac{1}{8}$?

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7 What is the common denominator for: $\frac{1}{3}$ $\frac{1}{4}$ $\frac{1}{6}$?

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8 Which pair of denominators has the smallest common denominator?

A 3 and 4

B 2 and 6

C 5 and 10

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9 24 is a common denominator for $\frac{1}{4}$ and $\frac{1}{6}$. Is it the smallest one?

- **A** Yes, 24 is the smallest
- **B** No, 12 is the smallest
- **C** No, 6 is the smallest
- **D** Yes, 24 is the only common denominator

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10 Use a common denominator to add $\frac{1}{2} + \frac{1}{4}$. What is the sum?

- **A** $\frac{3}{4}$
- **B** $\frac{2}{6}$
- **C** $\frac{1}{2}$
- **D** $\frac{5}{4}$

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ANSWER KEY

1. 6

2. 4

3. 3

4. $\frac{1}{2}$ and $\frac{1}{3}$

5. 12

6. 24

7. 12

8. 2 and 6

9. No, 12 is the smallest

10. $\frac{3}{4}$

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