Your notes

GCSE Maths: revision notes

Fractions

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Equivalent fractions and simplifying

- **Equivalent fractions** have the same value: 2/5 = 4/10 = 6/15. Multiply or divide the top and bottom by the same number.
- To simplify, divide the **numerator** and **denominator** by their highest common factor: 18/24 = 3/4 (dividing by 6).

Mixed numbers and improper fractions

- An **improper fraction** has a **numerator** bigger than its **denominator**: 11/4 = 2 3/4 (11 ÷ 4 = 2 remainder 3).
- To convert a **mixed number**: 3 1/2 = (3 × 2 + 1)/2 = 7/2.

Adding and subtracting

- Make the **denominators** the same first: 2/3 + 1/4 = 8/12 + 3/12 = 11/12.
- For **mixed numbers**, convert to **improper fractions** (or add the whole numbers and fractions separately).

Multiplying and dividing

- Multiply the **numerators** and multiply the **denominators**: 3/4 × 2/5 = 6/20 = 3/10.
- To divide, keep the first fraction, change ÷ to ×, and flip the second: 2/3 ÷ 4/5 = 2/3 × 5/4 = 10/12 = 5/6.
- Always convert **mixed numbers** to **improper fractions** before multiplying or dividing.

Fractions of amounts

- To find 3/5 of 40, divide by the **denominator** and multiply by the **numerator**: 40 ÷ 5 × 3 = 24.
- To write one quantity as a fraction of another, put the first over the second and simplify: 15 out of 60 = 15/60 = 1/4.

Worked examples

Work out 2/3 + 1/4

Find a common denominator: 12 is a multiple of 3 and of 4. **2/3 = 8/12 and 1/4 = 3/12**

Add the numerators; the denominator stays the same. **8/12 + 3/12 = 11/12**

Answer: 11/12

Work out 2½ ÷ 3/4

Change the mixed number into an improper fraction. **2½ = 5/2**

Keep the first fraction, change ÷ to ×, flip the second. **5/2 × 4/3**

Multiply the tops and the bottoms. **20/6**

Simplify, and change back to a mixed number. **20/6 = 10/3 = 3⅓**

Answer: 3⅓

Key terms

Numerator	The top number of a fraction.
Denominator	The bottom number of a fraction.
Equivalent fractions	Fractions that have the same value, such as 1/2 and 3/6.
Simplest form	A fraction whose numerator and denominator have no common factor except 1.
Improper fraction	A fraction whose numerator is larger than its denominator.
Mixed number	A whole number and a fraction together, such as 2 3/4.
Reciprocal	One divided by a number; the reciprocal of 4/5 is 5/4.

Quick questions

Cover the answers and test yourself: remembering is what makes it stick.

1. Simplify 18/24.
2. Work out 2/3 + 1/4.
3. Work out 5/6 – 1/3.
4. Work out 3/4 × 2/5.
5. Work out 2/3 ÷ 4/5.
6. What is 3/5 of 40?

Your notes

7. Write 11/4 as a mixed number.
8. Write 3 1/2 as an improper fraction.

Answers

1. 3/4
2. 11/12
3. 1/2
4. 3/10
5. 5/6
6. 24
7. 2 3/4
8. 7/2

What to do next

Practise 12 questions on this topic

Try 6 exam questions, with mark schemes

Read the lesson, one step at a time

Free revision for GCSE and KS3 at lycolearn.co.uk. Some notes are for one exam board only, and say so in brackets.

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