EZ Tutors | 11+ Preparation Series

# Fractions, Decimals & Percentages

Topic guide with worked examples and graded practice — Year 4-6 (Ages 8-11)

GL Assessment Aligned | Both Year Groups | 40 Practice Questions

## How to Use This Guide

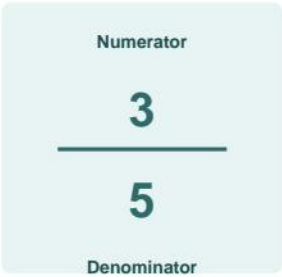
1. Read each topic explanation carefully — make sure you understand the method before practising.
2. Study the worked examples. Try to follow each step before looking at the answer.
3. Complete the Year 4–5 questions first, then the Year 5–6 Challenge questions.
4. Check your answers on the last page. Read every explanation, even for questions you got right.
5. Make a note of any topics you find difficult — revisit them before your exam.

## Contents

## Topic 1: Fractions — What They Are & Simplifying

A fraction represents a **part of a whole**. It has two parts:




**Numerator** = how many parts you have

**Denominator** = how many equal parts in total

So 3/5 means: 3 parts out of 5 equal parts.

### Simplifying (Cancelling Down)

Divide both the numerator and denominator by their **Highest Common Factor (HCF)** until no further division is possible.

| | | | |
|---|---|---|---|
| **Simplify 12/18** | HCF of 12 and 18 = 6 | 12 ÷ 6 = 2 \| 18 ÷ 6 = 3 | **Answer: 2/3** |
| **Simplify 20/24** | HCF of 20 and 24 = 4 | 20 ÷ 4 = 5 \| 24 ÷ 4 = 6 | **Answer: 5/6** |

■ **Key Method**

Top tip: To find the HCF, list the factors of both numbers and pick the largest one they share.
**HCF of 12: 1, 2, 3, 4, 6, 12 | HCF of 18: 1, 2, 3, 6, 9, 18 → HCF = 6**

## Topic 2: Equivalent Fractions

Equivalent fractions are **different fractions that represent the same amount**. You create them by multiplying or dividing both the numerator and denominator by the **same number**.

**1/2** ×2 → **2/4** ×3 → **6/12** All equal 1/2 !

**Finding a missing numerator or denominator:**

If 3/4 = ?/20 → the denominator was multiplied by 5, so the numerator must also be × 5: **3 × 5 = 15**. Answer: 15/20.

If ?/6 = 10/30 → the denominator was multiplied by 5, so the numerator must also be × 5: **? = 2**. (10 ÷ 5 = 2, working backwards).

Remember

**Always do the same operation to TOP and BOTTOM — or the fraction changes value.**
To compare fractions, convert them to equivalent fractions with the same denominator first.

## Topic 3: Adding & Subtracting Fractions

**Same denominator:** just add or subtract the numerators. The denominator stays the same.

3/8 + 2/8 = **5/8** | 7/10 − 3/10 = **4/10 = 2/5**

**Different denominators:** find the **Lowest Common Multiple (LCM)** of the denominators first, convert to equivalent fractions, then add or subtract.

| | |
|---|---|
| **1/3 + 1/4** | LCM of 3 and 4 = 12 1/3 = 4/12 1/4 = 3/12 4/12 + 3/12 = 7/12 |
| **5/6 − 1/4** | LCM of 6 and 4 = 12 5/6 = 10/12 1/4 = 3/12 10/12 − 3/12 = 7/12 |

**■ Mixed Numbers**

Mixed numbers: convert to improper fractions first, then add/subtract.
**E.g. 1 and 2/3 + 1/2: convert 1 2/3 to 5/3. LCM=6. 10/6 + 3/6 = 13/6 = 2 and 1/6**

## Topic 4: Multiplying & Dividing Fractions

**Multiplying fractions:** multiply the numerators together, then multiply the denominators together. Simplify if possible.

2/3 × 3/5 = (2×3)/(3×5) = 6/15 = **2/5**

**Dividing fractions:** flip the second fraction (find its reciprocal) then multiply. **KCF — Keep, Change, Flip.**

**Keep**
First fraction unchanged

**Change**
÷ becomes ×

**Flip**
Invert second fraction

**3/4 ÷ 2/5**
= 3/4 × 5/2
= 15/8
= **1 and 7/8**

**■ Reciprocals**

A reciprocal is the flipped version of a fraction: the reciprocal of 3/4 is 4/3.
**Any whole number n can be written as n/1, so the reciprocal of 5 is 1/5.**

## Topic 5: Fractions of Amounts

To find a fraction of an amount: **divide by the denominator, then multiply by the numerator.**

**Formula: Amount ÷ Denominator × Numerator**

| Question | Step 1: ÷ denominator | Step 2: × numerator | Answer |
|---|---|---|---|
| Find 3/4 of 48 | 48 ÷ 4 = 12 | 12 × 3 = 36 | 36 |
| Find 2/5 of 70 | 70 ÷ 5 = 14 | 14 × 2 = 28 | 28 |
| Find 5/8 of 96 | 96 ÷ 8 = 12 | 12 × 5 = 60 | 60 |
| Find 7/10 of 130 | 130 ÷ 10 = 13 | 13 × 7 = 91 | 91 |

**Common Mistake**

Always divide first, then multiply — even if the numbers look awkward.
**Check: your answer should be LESS than the original amount (since you want part of it).**

## Topic 6: Decimals — Place Value & Ordering

Every digit in a decimal number has a **place value**. The decimal point separates whole numbers from parts.

| Hundreds | Tens | Units | . | Tenths | Hundredths | Thousandths |
|---|---|---|---|---|---|---|
| 3 | 4 | 7 | | 2 | 0 | 5 |

So 347.205 = 3 hundreds + 4 tens + 7 units + 2 tenths + 0 hundredths + 5 thousandths

**Ordering decimals:**

Compare digit by digit from LEFT to RIGHT. Add trailing zeros so all numbers have the same number of decimal places first.

Order 0.7, 0.07, 0.72, 0.709 → write as 0.700, 0.070, 0.720, 0.709 → order: **0.07, 0.7, 0.709, 0.72**

## Topic 7: Fractions ↔ Decimals ↔ Percentages

These three forms all represent the same values — you must be able to convert between them instantly in the 11+ exam.

| Fraction | Decimal | Percentage | Fraction | Decimal | Percentage |
|---|---|---|---|---|---|
| 1/2 | 0.5 | 50% | 1/10 | 0.1 | 10% |
| 1/4 | 0.25 | 25% | 3/10 | 0.3 | 30% |
| 3/4 | 0.75 | 75% | 1/5 | 0.2 | 20% |
| 1/3 | 0.333... | 33.3% | 2/5 | 0.4 | 40% |
| 2/3 | 0.666... | 66.7% | 4/5 | 0.8 | 80% |
| 1/8 | 0.125 | 12.5% | 1/100 | 0.01 | 1% |
| 3/8 | 0.375 | 37.5% | 1/1000 | 0.001 | 0.1% |

**■ Conversion Methods**

To convert fraction to decimal: divide numerator by denominator (3/4 = 3÷4 = 0.75)
To convert decimal to %: multiply by 100 (0.35 × 100 = 35%)
**To convert % to fraction: put over 100 and simplify (35% = 35/100 = 7/20)**

## Topic 8: Percentages of Amounts

The **build-up method** is the fastest approach in exam conditions:

| | | |
|---|---|---|
| **Find 35% of 240** | 10% = 24 \| 30% = 72 \| 5% = 12 | **35% = 72 + 12 = 84** |
| **Find 17.5% of 80** | 10% = 8 \| 5% = 4 \| 2.5% = 2 | **17.5% = 8 + 4 + 2 = 14** |
| **Find 15% of 340** | 10% = 34 \| 5% = 17 | **15% = 34 + 17 = 51** |

**Calculator method (not for 11+, but good to understand):** Amount × percentage ÷ 100. E.g. 240 × 35 ÷ 100 = 84.

## Topic 9: Percentage Increase & Decrease

**Percentage increase:** find the percentage of the amount, then **add** it to the original.

Increase £64 by 25%: 25% of 64 = 16. £64 + £16 = **£80**

**Percentage decrease:** find the percentage of the amount, then **subtract** it from the original.

Decrease £64 by 25%: 25% of 64 = 16. £64 − £16 = **£48**

**Advanced Method**

Multiplier method (faster): Increase by 20% → multiply by 1.20

**Decrease by 15% → multiply by 0.85 (because 100% - 15% = 85% = 0.85)**

This method is very fast once mastered and impresses examiners.

## Practice Questions — Year 4–5 Standard (Questions 1–20)

Answer all 20 questions. Write your answer on the line provided. Show any working in the space below each question.

| | | |
|---|---|---|
| 1 | Simplify the fraction 6/9. | Answer: _____ |
| 2 | What is 2/3 of 30? | Answer: _____ |
| 3 | Write 0.75 as a fraction in its simplest form. | Answer: _____ |
| 4 | What is 50% of 84? | Answer: _____ |
| 5 | Order these fractions from smallest to largest: 3/4, 1/2, 7/8, 1/4 | Answer: _____ |
| 6 | Write 3/5 as a decimal. | Answer: _____ |
| 7 | Find 1/4 of 96. | Answer: _____ |
| 8 | What is 25% of 60? | Answer: _____ |
| 9 | Simplify the fraction 15/20. | Answer: _____ |
| 10 | Write 0.4 as a percentage. | Answer: _____ |
| 11 | Find 2/5 of 45. | Answer: _____ |
| 12 | What is 10% of 370? | Answer: _____ |
| 13 | Are 3/4 and 6/8 equivalent fractions? Explain how you know. | Answer: _____ |
| 14 | Write 40% as a fraction in its simplest form. | Answer: _____ |
| 15 | Find the missing number: 2/3 = __/12 | Answer: _____ |
| 16 | What is 0.6 as a fraction in its simplest form? | Answer: _____ |
| 17 | Find 3/8 of 56. | Answer: _____ |
| 18 | A bag of 30 sweets — James eats 1/5. How many sweets does he eat? | Answer: _____ |
| 19 | Write 1/8 as a decimal. | Answer: _____ |
| 20 | What is 30% of 90? | Answer: _____ |

## Practice Questions — Year 5–6 Challenge (Questions 21–40)

These questions are at full 11+ difficulty. Read each carefully and show all working.

| | | |
|---|---|---|
| 21 | A jacket costs £120. It is reduced by 35% in a sale. What is the sale price? | Answer: _____ |
| 22 | Write 7/8 as a decimal. | Answer: _____ |
| 23 | Find 5/6 of 144. | Answer: _____ |
| 24 | What is 17.5% of 240? | Answer: _____ |
| 25 | Arrange in ascending order: 0.6, 3/5, 65%, 0.605 | Answer: _____ |
| 26 | A school has 480 pupils. 3/8 take packed lunches. How many take packed lunches? | Answer: _____ |
| 27 | Simplify the fraction 84/120. | Answer: _____ |
| 28 | Find the missing number: 5/6 = 40/__ | Answer: _____ |
| 29 | What percentage of 64 is 16? | Answer: _____ |
| 30 | A price increases from £80 to £92. What is the percentage increase? | Answer: _____ |
| 31 | 3/4 + 5/6 = ? Give your answer as a mixed number. | Answer: _____ |
| 32 | Which is larger: 7/12 or 5/9? Show your working. | Answer: _____ |
| 33 | A runner completes 5/7 of a 42 km race. How far have they run? | Answer: _____ |
| 34 | Convert 0.875 to a fraction in its simplest form. | Answer: _____ |
| 35 | Find 2/3 of 2/5. Give your answer in its simplest form. | Answer: _____ |
| 36 | A shop has 240 items. 30% are sold. 1/4 of the rest are returned. How many remain? | Answer: _____ |
| 37 | 3 and 1/2 – 1 and 3/4. Give your answer as a mixed number. | Answer: _____ |
| 38 | What is 0.07 as a percentage? | Answer: _____ |
| 39 | A TV costs £360 after a 20% discount. What was the original price? | Answer: _____ |
| 40 | Express 2 and 3/8 as a decimal. | Answer: _____ |

## Answers & Explanations — Questions 1–20

| Q | Answer | Explanation |
|---|---|---|
| 1 | **2/3** | Divide both by 3: 6÷3=2, 9÷3=3. |
| 2 | **20** | 30 ÷ 3 = 10 (one third), then × 2 = 20. |
| 3 | **3/4** | 0.75 = 75/100. HCF = 25. 75÷25=3, 100÷25=4. |
| 4 | **42** | 50% = half. 84 ÷ 2 = 42. |
| 5 | **1/4, 1/2, 3/4, 7/8** | Convert to common denominator 8: 2/8, 4/8, 6/8, 7/8. |
| 6 | **0.6** | 3 ÷ 5 = 0.6. Divide numerator by denominator. |
| 7 | **24** | 96 ÷ 4 = 24. (Divide by denominator only needed for 1/4.) |
| 8 | **15** | 10% of 60 = 6. 25% = 6 + 9 = 15. Or: 60 ÷ 4 = 15. |
| 9 | **3/4** | HCF of 15 and 20 = 5. 15÷5=3, 20÷5=4. |
| 10 | **40%** | 0.4 × 100 = 40%. |
| 11 | **18** | 45 ÷ 5 = 9 (one fifth), then × 2 = 18. |
| 12 | **37** | 10% of 370 = 37. |
| 13 | **Yes** | 3/4 × 2/2 = 6/8. Multiplying top and bottom by 2 gives equivalent fraction. |
| 14 | **2/5** | 40% = 40/100. HCF = 20. 40÷20=2, 100÷20=5. |
| 15 | **8** | 2/3 = 8/12. Denominator ×4, so numerator ×4: 2×4=8. |
| 16 | **3/5** | 0.6 = 6/10. HCF=2. 6÷2=3, 10÷2=5. |
| 17 | **21** | 56 ÷ 8 = 7 (one eighth), then × 3 = 21. |
| 18 | **6 sweets** | 30 ÷ 5 = 6. (1/5 of 30.) |
| 19 | **0.125** | 1 ÷ 8 = 0.125. Worth memorising this conversion. |
| 20 | **27** | 10% of 90 = 9. 30% = 9 × 3 = 27. |

## Answers & Explanations — Questions 21–40 (Challenge)

| Q | Answer | Explanation |
|---|---|---|
| 21 | **£78** | 35% of 120 = 42. £120 − £42 = £78. |
| 22 | **0.875** | 7 ÷ 8 = 0.875. Learn all eighths as decimals. |
| 23 | **120** | 144 ÷ 6 = 24. 24 × 5 = 120. |
| 24 | **42** | 10%=24, 5%=12, 2.5%=6. 17.5% = 24+12+6 = 42. |
| 25 | **3/5, 0.6, 0.605, 65%** | Convert all: 0.600, 0.600, 0.605, 0.650. |
| 26 | **180** | 480 ÷ 8 = 60. 60 × 3 = 180. |
| 27 | **7/10** | HCF of 84 and 120 = 12. 84÷12=7, 120÷12=10. |

| | | |
|---|---|---|
| 28 | **48** | 5/6 = 40/48. Numerator ×8, denominator must also ×8: 6×8=48. |
| 29 | **25%** | 16/64 = 1/4 = 25%. |
| 30 | **15%** | Increase = £12. 12/80 × 100 = 15%. |
| 31 | **1 and 7/12** | 3/4=9/12, 5/6=10/12. 9/12+10/12=19/12=1 and 7/12. |
| 32 | **7/12** | Convert: 7/12 vs 5/9=60/108 vs 63/108. 7/12>5/9. |
| 33 | **30 km** | 42 ÷ 7 = 6. 6 × 5 = 30 km. |
| 34 | **7/8** | 0.875 = 875/1000. HCF=125. 875÷125=7, 1000÷125=8. |
| 35 | **2/15** | 2/3 × 2/5 = 4/15. Wait: 2×2=4, 3×5=15. Cannot simplify. Answer: 4/15. |
| 36 | **126** | 240 sold: 72. Remaining: 168. Returned: 1/4 of 168=42. Left: 126. |
| 37 | **1 and 3/4** | 3 and 1/2 = 7/2 = 14/4. 1 and 3/4 = 7/4. 14/4−7/4=7/4=1 and 3/4. |
| 38 | **7%** | 0.07 × 100 = 7%. |
| 39 | **£450** | £360 = 80%. 1% = £4.50. 100% = £450. |
| 40 | **2.375** | 2 and 3/8: 3÷8=0.375. So 2.375. |