Year 8 Prime Factors and Rounding – Revision Notes

HappyKids.fit

Year 8 · Maths · Prime Factors, Place Value and Rounding · Key ideas and worked examples

For grown-ups and learners: read each part and try the worked example. Then work through the sheets: Foundation, Developing, Challenge, then Mixed Practice to revise everything. Show your working: it earns marks in tests and helps you spot mistakes.

1. Prime factors

Every whole number greater than 1 can be written as a **product of prime factors** in exactly one way. Split the number with a factor tree until every branch ends in a prime: 360 = 2 × 180 = 2 × 2 × 90 = … = **$2^3 \times 3^2 \times 5$**.

Example: Write 308 as a product of prime factors. Use index notation.
→ 308 = 2 × 154, 154 = 2 × 77, 77 = 7 × 11…
→ 308 = $2^2 \times 7 \times 11$
Answer: $2^2 \times 7 \times 11$

2. HCF and LCM from prime factors

For the **HCF**, take the primes that appear in **both** numbers, each with the **smaller** power. The **LCM** uses **every** prime, each with the **larger** power. With 72 = $2^3 \times 3^2$ and 60 = $2^2 \times 3 \times 5$: HCF = $2^2 \times 3$ = **12** and LCM = $2^3 \times 3^2 \times 5$ = **360**.

Example: A = $2^2 \times 3 \times 7^2$ and B = 2×7^2. Use the prime factors to find the HCF and the LCM of A and B.
→ HCF: primes in both, smaller powers: 98
→ LCM: every prime, larger powers: 588
Answer: HCF = 2×7^2 = 98; LCM = $2^2 \times 3 \times 7^2$ = 588

3. Multiplying and dividing by 0.1 and 0.01

0.1 = 1/10 and 0.01 = 1/100. So **× 0.1** is the same as **÷ 10**, and **÷ 0.01** is the same as **× 100**: 4.7 × 0.1 = 0.47 and 3.2 ÷ 0.01 = 320.

Example: 753 ÷ 0.01 = ?
→ ÷ 0.01 is the same as × 100
→ = 75300
Answer: 75 300

4. Significant figures

The first **significant figure** is the first non-zero digit. To round 36 481 to 3 s.f., keep 3 6 4, look at the next digit (8) and round up: **36 500**. For 0.004 762 to 2 s.f., start at the 4: **0.0048**. Rounding to 1 s.f. gives quick estimates: $61.3 \times 0.08 \div 7.2 \approx 60 \times 0.08 \div 8 = 0.6$.

Think like a mathematician: test a few cases (**specialising**), look for the rule that always works (**generalising**), and explain why you are sure (**convincing**). When you check someone's working, say what is wrong and how to **improve** it.

Common mistakes: counting leading zeros as significant. Leaving a non-prime such as 4 or 15 in a prime factorisation. Treating ÷ 0.1 as ÷ 10. Using the larger powers for the HCF.