

Exercise walk-through

# 1.1

## Ordering, four operations, factors and indices

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# 1. Unit 3.1 at a glance

## Unit 3.1 at a glance

Core N1-N20: ordering, four operations, factors and indices, standard form, sets, calculator use, rounding, FDP operators, percentage change, ratio and proportion.

Extension additions: index-form factors, fractional powers, exact surds, bounds calculations, recurring decimals, reverse percentage, the compound interest formula, exponential growth and decay.

NO formulae sheet in 9260 - the recall list is the specification itself. Spec lines with no specimen marks are taught as specification originals and labelled.

## 2. Ordering and the four operations

### Ordering and the four operations

Order on the number line with  $=$ , not-equal,  $<$ ,  $>$  - convert to one form first ( $3/5 = 0.6$ ). Formal methods for integers, decimals, fractions and mixed numbers:  $2 \frac{1}{3} + 1 \frac{1}{4} = 43/12 = 3 \frac{7}{12}$ .

Inverse operations cancel early:  $(15/28) \times (7/9) = 5/12$  after cancelling the 7 and the 3.

# Check yourself

## Check yourself

Ordering and formal methods; inverse cancellation; index-form factors with HCF and LCM; fractional powers; exact surds and rationalising; standard form; sets with counts; rounding.

Bounds choosing the right extremes; FDP operators; recurring decimals; reverse percentage; compound interest; ratio sharing and rates; direct and inverse proportion; exponential models fitted and solved.

## Exercises 2.1·2.3

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**2.1** Order from smallest:  $0.7$ ,  $\frac{5}{8}$ ,  $67\%$

[2]

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**2.2** Work out  $2\frac{1}{3} + 1\frac{1}{4}$

[3]

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**2.3** Work out  $\frac{15}{28} \times \frac{7}{9}$

[3]

## Exercises 2.1·2.3

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**2.1** Order from smallest:  $0.7$ ,  $\frac{5}{8}$ ,  $67\%$  [2]

**2.1**  $\frac{5}{8} = 0.625 < 0.67 < 0.7$ : so  $\frac{5}{8}$ ,  $67\%$ ,  $0.7$ .

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**2.2** Work out  $2\frac{1}{3} + 1\frac{1}{4}$  [3]

**2.2**  $\frac{28}{12} + \frac{15}{12} = \frac{43}{12} = 3\frac{7}{12}$ .

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**2.3** Work out  $\frac{15}{28} \times \frac{7}{9}$  [3]

**2.3** Cancel 7 with 28, then 3 with 15:  $\frac{15}{4} \times \frac{1}{9} = \frac{15}{36} = \frac{5}{12}$ .

## Exercises 2.4·3.1

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**2.4** Write 504 and 588 as products of primes in index form [3]

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**2.5** Find the HCF and LCM of 504 and 588 [3]

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**3.1** (*Original, 1E specimen HCF family.*) Two schools have 504 and 588 exercise books to distribute into identical equal stacks. (a) Find the largest number of books per stack. (b) How many stacks does each school need? [4]

## Exercises 2.4·3.1

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**2.4** Write 504 and 588 as products of primes in index form [3]

**2.4**  $504 = 2^3 \times 3^2 \times 7$ ;  $588 = 2^2 \times 3 \times 7^2$ .

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**2.5** Find the HCF and LCM of 504 and 588 [3]

**2.5**  $\text{HCF} = 2^2 \times 3 \times 7 = 84$ ;  $\text{LCM} = 2^3 \times 3^2 \times 7^2 = 3528$ .

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**3.1** (*Original, 1E specimen HCF family.*) Two schools have 504 and 588 exercise books to distribute into identical equal stacks. (a) Find the largest number of books per stack. (b) How many stacks does each school need? [4]

**3.1** (a) Largest stacks use the HCF: 84 books per stack. (b)  $504 \div 84 = 6$  and  $588 \div 84 = 7$  stacks.

## Exercises 3.2·3.3

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**3.2** (*Original.*) Two bells ring together; one rings every 504 s, the other every 588 s. After how many seconds do they next ring together? [2]

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**3.3** (*Original.*)  $a = 2^3 \times 3^2 \times 5$  and  $b = 2^2 \times 3 \times 7$ . Write down, in index form where possible, the HCF and LCM of  $a$  and  $b$ . [4]

## Exercises 3.2-3.3

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**3.2** (*Original.*) Two bells ring together; one rings every 504 s, the other every 588 s. After how many seconds do they next ring together? [2]

**3.2**  $\text{LCM} = 3528$  seconds.

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**3.3** (*Original.*)  $a = 2^3 \times 3^2 \times 5$  and  $b = 2^2 \times 3 \times 7$ . Write down, in index form where possible, the HCF and LCM of  $a$  and  $b$ . [4]

**3.3**  $\text{HCF} = 2^2 \times 3 = 12$ ;  $\text{LCM} = 2^3 \times 3^2 \times 5 \times 7 = 2520$ .

Local review guidance: index-form factorisations before combining; exact stack counts; context answers name HCF or LCM and why. This is authored classroom guidance.