1.1 Ordering, four operations, factors and indices

Name: _____ Class: _____ Date: _____ **Total: 24 marks**

KEY WORDS highest common factor

Ordering, four operations, factors and indices

Objective

Order integers, decimals and fractions; apply the four operations with inverse cancellation; use factor vocabulary with index-form prime factorisation, HCF and LCM (rows N1–N4 with the Extension index-form addition).

1 Key knowledge and worked examples

Operations. Convert to compare ($\frac{3}{5} = 0.6$); mixed numbers by common denominators: $2\frac{1}{3} + 1\frac{1}{4} = \frac{43}{12} = 3\frac{7}{12}$. Cancel early with inverse operations: $\frac{15}{28} \times \frac{7}{9} = \frac{15}{4} \times \frac{1}{9} = \frac{5}{12}$.

Factors. $504 = 2^3 \times 3^2 \times 7$ and $588 = 2^2 \times 3 \times 7^2$ (index form). HCF: lowest power of each common prime $= 2^2 \times 3 \times 7 = 84$ (the 1E specimen answer); LCM: highest power of every prime $= 2^3 \times 3^2 \times 7^2 = 3528$.

$72 = 2^3 \times 3^2$

$90 = 2 \times 3^2 \times 5$

Shared smallest powers: $2 \times 3^2 = 18$

Original native-lesson illustration; labels belong to its worked example.

2 Practice

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

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

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

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

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

3 Exam-style questions

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]

3.2 *(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]

3.3 *(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]

Solutions

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

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

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

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

2.5 HCF $= 2^2 \times 3 \times 7 = 84$; LCM $= 2^3 \times 3^2 \times 7^2 = 3528$.

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

3.2 LCM = 3528 seconds.

3.3 HCF $= 2^2 \times 3 = 12$; 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.