Number Properties: Hard Practice Paper 7 Answers

Q#	Answer	Explanation
1	D	Write each as prime factors: 132 is 2 × 2 × 3 × 11 and 198 is 2 × 3 × 3 × 11. The primes they share are 2, 3 and 11, and 2 × 3 × 11 = 66.
2	D	The answer needs 2 × 2 to cover the 12, 3 × 3 to cover the 9 and a 5 to cover the 15. Multiplying those gives 4 × 9 = 36, and then 36 × 5 = 180.
3	B	A number has an odd number of factors only when it is a square, and 36 is the only square here. Its factors are 1, 2, 3, 4, 6, 9, 12, 18 and 36, which is nine of them.
4	C	The primes are 101, 103, 107, 109 and 113, which is five numbers. Others in that range have factors: 111 is 3 × 37, 117 is 9 × 13 and 119 is 7 × 17.
5	A	The highest common factor is built from the primes both numbers share. A and B share 2, 2 and 3, and 2 × 2 × 3 = 12. A and C share 2, 3 and 5, giving 30, B and C share only 2 and 3, and the pairs with D share nothing but 2s.
6	C	Divide 1,000 by 13: 13 × 76 = 988, which is 12 short of 1,000. Taking 12 away leaves 988, so 12 is the smallest amount that works.
7	C	Since 5 × 5 = 25, the square root of 2,500 is 50, and since 3 × 3 = 9, the square root of 900 is 30. Then 50 + 30 = 80.
8	C	The left part of the diagram holds the squares that are not multiples of 5. There are 10 square numbers up to 100, of which 25 and 100 are multiples of 5, so 10 − 2 = 8 are left in that part.
9	E	A prime number has exactly two different factors, 1 and itself. The number 1 has only one factor, so it does not meet that rule.
10	C	Both numbers must be multiples of 7, and multiplying the HCF by the LCM gives their product: 7 × 84 = 588. The pair 21 and 28 fits, since 21 × 28 = 588 and both are below 50, so the larger is 28.

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11	C	The primes there are 31 and 37, since 33 and 39 divide by 3 and 35 divides by 5. Adding them gives 31 + 37 = 68.
12	D	The number must be a common multiple of 6, 8 and 9. It needs 2 × 2 × 2 to cover the 8 and 3 × 3 to cover the 9, so the smallest is 8 × 9 = 72.
13	C	A cube number is a whole number multiplied by itself three times, and 6 × 6 × 6 = 216. The others are not cubes: 225 is a square, since 15 × 15 = 225, and 400 is a square too.
14	C	The number can be built only from 3s and 5s, and 3 × 3 × 5 × 5 = 225, which lies between 200 and 250. The others fail: 210 also has 2 and 7 as factors, 216 and 240 both have a factor of 2, and 245 has a factor of 7.
15	C	The middle number is the total shared into three: 87 ÷ 3 = 29. So the numbers are 28, 29 and 30, and 28 + 29 + 30 = 87. The largest is 30.

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