Number Properties: Medium Practice Paper 10 Answers

Q#	Answer	Explanation
1	B	Write each number as a product of primes. 30 is 2 × 3 × 5, which uses three different primes. 12 is 2 × 2 × 3, which uses only two different primes. 45 is 3 × 3 × 5, which also uses two. 49 is 7 × 7 and 16 is 2 × 2 × 2 × 2, which use one each.
2	C	The lowest common multiple is the smallest number that both numbers divide into. For 6 and 5 it is 30, because 30 is the first multiple of 6 that is also a multiple of 5. For the other choices the lowest common multiples with 6 are 12, 12, 60 and 18.
3	E	A cube number is made by multiplying a whole number by itself and then by itself again. 5 × 5 × 5 = 125, which is between 100 and 200. The numbers 121, 144 and 169 are square numbers, not cube numbers.
4	D	There are 15 multiples of 2 and 10 multiples of 3 up to 30. But the multiples of 6, which are 6, 12, 18, 24 and 30, are in both lists and must not be counted twice. The answer is 15 + 10 − 5 = 20.
5	B	A number between 100 and 200 starts with 1, so a palindromic one must also end with 1. The middle digit can be anything from 0 to 9. That gives 101, 111, 121, 131, 141, 151, 161, 171, 181 and 191, which is 10 numbers.
6	E	Count the factors of the small numbers. 2, 3 and 5 are prime, so they have two factors each. 4 has three factors: 1, 2 and 4. 6 has four factors: 1, 2, 3 and 6. So 6 is the smallest. The numbers 8 and 10 also have four factors, but they are bigger.
7	C	Four consecutive numbers always contain two odd numbers and two even numbers. The two odd numbers add to make an even number, so the whole total is even. It is not always a multiple of 4 or of 3: for example, 1 + 2 + 3 + 4 = 10.

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8	E	Add the digits of each choice. The totals are 3, 6, 12 and 27 for 111, 222, 444 and 999, and none of those is a square number. For 333 the total is 3 + 3 + 3 = 9, and 9 is a square number because 3 × 3 = 9.
9	C	Keep doubling from 2: the powers of 2 are 2, 4, 8, 16, 32, 64, 128, ... The number 64 is in the list. The others are not: 24 and 48 each contain a factor of 3, 36 contains a factor of 9 and 100 contains a factor of 25.
10	D	6 is 2 × 3, so every multiple of 6 is a multiple of 2, which means it is even. The other statements can be false: 6 itself is not a multiple of 4 or of 12 and is not bigger than 10, and 12 does not end in 6.
11	A	The factors of 12 are 1, 2, 3, 4, 6 and 12, and the factors of 18 are 1, 2, 3, 6, 9 and 18. The largest number in both lists is 6. For the other pairs the highest common factors are 3, 12, 18 and 2.
12	E	The small square numbers are 1, 4 and 9. Adding two of them, 4 + 9 = 13. The other totals that can be made are 2, 5, 8, 10 and 18, so 3, 6, 7 and 11 cannot be made.
13	C	The largest factor of any number is the number itself, so n is the number. Factors pair up to multiply to the number: 2 pairs with 10 and 4 pairs with 5, and 2 × 10 = 20 and 4 × 5 = 20. So n is 20, which pairs with 1.
14	D	The smallest three-digit number is 100, but it is even. The next number, 101, cannot be divided exactly by 2, 3, 5 or 7, so it is prime. The numbers 103 and 107 are prime as well, but they are bigger, and 111 is 3 × 37.
15	E	Two digits that multiply to 12 could be 2 and 6, or 3 and 4. Only 3 and 4 add up to 7. They make the numbers 34 and 43, and the odd one is 43.

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