Q 1. What is the least sum of a set of 5 distinct prime numbers whose average is also a prime number?

Q 2. The mean and median of Ashok's 7 scores is 74. If his lowest 2 scores are not considered, the mean increased by 1 whereas the median remained the same. What is the highest score he could have got, if all his scores were whole numbers and and no number except 74 appears more than once?

1) 78

2) 79

3) 80

4) 81

Q 3. A big cube is completely sliced into 64 identical cubes. If 12 litres of paint was used to paint the original cube, how many more litres of paint will be required to paint the smaller cubes on all the faces?

1) 18

2) 24

3) 36

4) 48

Q 4. Anuj can complete a piece of work in 8 days, Bhanu in 12 days and Chetan in 16 days. All of them started the work together but Chetan left when he realised that the remaining work will be completed without him in the next three days, and Bhanu left when he realised that the remaining work will be completed without him in the next two days. Find the total number of days taken to complete the work.

1) 4

2) 5

3) 6

4) 10

Q 5. The interest accrued in the first two years and that in the first three years on a sum invested at a certain rate of interest, compounded annually, were Rs. 1,100 and Rs. 1,820 respectively. What was the rate of interest?

1) 10%

2) 24%

3) 30%

4) 20%

Q 6. At the end of the year 2022, Madan had Rs. 500 and Birju had Rs. 50,000. At the end of every year, Madan will have twice as much money as he did at the end of the previous year and Birju will have 60% of the money that he did at the end of the previous year. At the end of which year will Madan have more money than Birju for the first time?

1) 2025

2) 2026

3) 2027

4) 2028

Q 7. Let $f(x) = x^2 + ax + b$ be a quadratic, where a and b are integers with $5 \le a, b \le 11$. For how many distinct ordered pairs (a, b) will f(x) not have real solutions ?
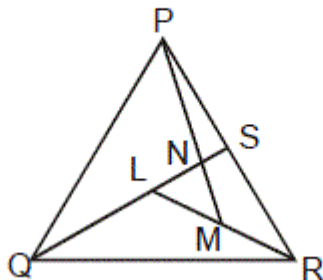

Q 8. In how many ways can 10 be written as the sum of two or more natural numbers? Consider (1 + 9) to be different from (9 + 1).

1) 1024

2) 512

3) 511

4) 1023

Q 9. Find the number of solutions of the equation $\log_3 (x + 5) = 6 - x$.

Q 10.
In the figure given below, PS : SR = 1 : 2, QL : LS = 1 : 2 and LM = MR. Find the ratio of the area of triangle PQR to that of LMN.

1) 9 : 1

2) 6 : 1

3) 24 : 5

4) 3 : 1

Q 11. The number of factors of the number of balls in four boxes – P, Q, R and S – is 16, 28, 40 and 49 respectively. If Ravi wants to pick a box, out of the four boxes, which box should he pick to be sure of picking up of a box in which the number of balls is the cube of a natural number?

1) P

2) Q

3) R

4) S

Q 12. A square shaped floor of dimensions 35 × 35 is fully covered with square shaped tiles of dimensions 1 × 1, 2 × 2 and 3 × 3. The number of tiles used of dimensions 1 × 1 to cover the floor cannot be less than

1) 1

2) 2

3) 4

4) 8

Q 13. Vishal went from A to B at a certain speed and came back to A from B at a speed that was twice the speed at which he went from A to B. The entire journey took 5 hours. Had Vishal returned at a speed that was 25% more than the speed at which he actually returned, how long would it have taken him for the entire journey?

1) 4 hours 40 minutes

2) 4 hours 30 minutes

3) 5 hours 15 minutes

4) 3 hours 40 minutes

Q 14. A total of 'x' litres of pure milk was drawn from a vessel containing 256 litres of pure milk and was replaced with water. The resulting mixture was thoroughly mixed to obtain a homogenous solution and then again 'x' litres of solution was drawn, and replaced with water. The resulting mixture was thoroughly mixed. This procedure was performed four times and the vessel now contained 81 litres of pure milk. Find the value of 'x'.

Q 15. For non-negative real numbers x and y, 3x + 4y ≤ 16 and 5x + 2y ≤ 10. What is the maximum possible value of (4x + 10y)?

1) 40

2) 32

3) 48

4) 52

Q 16.

Find the value of the following expression:

$$\log_{0.001}\left[\frac{1}{2}\right] + \log_{0.001}\left[\frac{2}{3}\right] + \log_{0.001}\left[\frac{3}{4}\right] + \dots + \log_{0.001}\left[\frac{99}{100}\right].$$

1) − 3/2

2) 2/3

3) 3/2

4) − 2/3

Q 17. Ramu gave away return gifts on the occasion of his daughter's birthday. Every gift was a pack of 1 Toy, 2 Chocolates and 1 Book. The Toys were available in boxes of 30 Toys each, the Chocolates in boxes of 40 Chocolates each and the Books came in boxes of 15 books each. Ramu made no incomplete gift and there were no unused Toys, Chocolates or Books. What is the minimum number of boxes purchased for the party?

Q 18. If P is a point on $x^2 + y^2 + 18 = 2(5x + 3y)$ and Q is a point on $x^2 + y^2 + 240 = 2(16x + 3y)$, the distance (in units) between P and Q cannot be more than

1) 18

2) 20

3) 21

4) 23

Q 19. Ramlal, a fruit vendor, sells only apples and oranges. One day in the morning, he bought the two types of fruits in the ratio 3 : 5 respectively. Later on, he found that 8% of the apples and 12% of the oranges were rotten. At the end of the day, he was left with 24 fruits, which accounted for 4% of the total number of fruits that he had bought in the morning. On the given day, if Ramlal sold only those fresh fruits that he had bought in the morning and disposed of all the rotten fruits during the course of the day, the number of fruits sold by Ramlal was

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Q 20. If f(x) = |x − 4| and g(x) = x^2, find the number of values of x for which f(g(x)) = g(f(x)).

Q 21. The percentage volumes of liquid 'A' in three solutions – I, II and III – form a geometric progression in that order. If we mix I, II and III solutions in the ratio 2 : 3 : 4, we obtain a solution containing 32% of A. If we mix them in the ratio 3 : 2 : 1, we obtain a solution containing 22% of A. What is the percentage of liquid A in II?

1) 18%

2) 36%

3) 24%

4) 48%

Q 22. The marks scored by Pankaj in three subjects are in the ratio 4 : 5 : 6. Pankaj scored an overall aggregate of 62.5% in the exam. If the maximum marks in each subject are in the ratio 3 : 4 : 5, in how many subjects did Pankaj score more than 65% marks?