**Q 1.** Two types of rice P and Q are mixed and then sold at Rs. 60 per kg. The profit is 20% if P and Q are mixed in the ratio 4 : 3, and profit is 10% if this ratio is 3 : 4. The cost prices per kg of P and Q are in the ratio

**1)** 9 : 16

**2)** 8 : 15

**3)** 7 : 16

**4)** 2 : 5

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**Q 2.** If $x^4 - y^4 = 65$, where x and y are natural numbers, then the value of the expression $x^4 + y^4$ is

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**Q 3.** Let S = {1, 2, 3, 4, ..., 27}. Three different numbers of this set are selected and their sum is calculated. How many such selections of 3 elements will give a sum of 72?

**1)** 21

**2)** 7

**3)** 15

**4)** 5

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**Q 4.** Ravi made an upstream journey of 15 km in a certain time. If his speed in still water was 2 km/h less and the speed of the stream was 2 km/h more, he would have taken five hours more for that journey. Find his upstream speed (in km/h).

**1)** 5

**2)** 2

**3)** 4

**4)** 6

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**Q 5.** A circle is drawn inside an isosceles trapezium, whose non-parallel sides are 30 cm long. The circle touches all the four sides of the trapezium. What is the length (in cm) of the line joining the midpoints of the non-parallel sides of the trapezium?

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**Q 6.** If $\log(x^4 y) = 1$; $\log(xy^3) = 2$, what is the value of $\log(xy)$?

**1)** 8/11

**2)** 8/33

**3)** 3/5

**4)** 3/11

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**Q 7.** Shawn was asked to add the numbers from 1 to 'n'. When teacher asked for the sum, he answered 1020. The teacher noted that Shawn missed adding a few numbers between 1 and 'n', excluding 1 and n. If n = 45, what is ratio of the minimum and maximum number of numbers Shawn could have missed?

**1)** 1 : 3

**2)** 2 : 3

**3)** 1 : 4

**4)** 1 : 5

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**Q 8.** Shiv can do a piece of work in 10 hours. He starts the work on Monday at 10:00 AM, and after each successive hour, starting from 11:00 AM, a man, of half the efficiency of the man who started working just before, joins the existing member(s). By what time the work will be completed on that day?

**1)** 1:00 PM

**2)** 2:00 PM

**3)** 4:00 PM

**4)** 3:00 PM

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**Q 9.** The coordinates of two diagonally opposite vertices of a rectangle are (4, 3) and (−4, −3). Find the number of such rectangle(s), if the other two vertices also have integral coordinates.

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**Q 10.** Let S = {3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15}. The number of subsets of S comprising composite number(s) only and that of those comprising prime number(s) only are $N_1$ and $N_2$ respectively, then $|N_1 - N_2|$ is divisible by how many distinct prime numbers?

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**Q 11.** Find the solution set for [x] + [2x] + [3x] + [4x] = 14, where x is a real number and [x] is the greatest integer less than or equal to x.

**1)** $x < 5/3$

**2)** $3/2 \le x < 5/3$

**3)** $1 \le x < 4/3$

**4)** $1/2 \leq x < 2$

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**Q 12.** Heera, a fruit vendor, sold 12 coconuts, all of which are of the same cost price, such that profit percentage on no two coconuts is the same. The profits made on the given coconuts were in an arithmetic progression. If the profit percentage of the coconut with 5th highest and 8th highest selling price were 14% and 11% respectively, find the profit percentage on the whole.

**1)** 12%

**2)** 12.5%

**3)** 13%

**4)** 13.5%

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**Q 13.** What is the largest integer that will always divide the number $(n + 1)(n + 3)(n + 5)(n + 7)(n + 9)$ for all positive even integers n?

**1)** 15

**2)** 35

**3)** 105

**4)** 165

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**Q 14.** For all natural numbers N, f(N) is defined as the sum of the digits of the number. How many 3 digit natural numbers N less than 500 are there such that f(N) is equal to 12?

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**Q 15.** The average scores of students of sections A, B and C in the Mathematics test were 66, 72 and 84, respectively. If the average score of the students of sections A and B together is 68 and that of sections B and C together is 78, then find the average score of the students of sections A and C together.

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**Q 16.** ABCD is a parallelogram. AB = 20 cm and AD = 40 cm. Points P and Q on AB and AD respectively are such that AP : PB = 1 : 3 and AQ : QD = 3 : 2. In what ratio will PQ divide the diagonal AC?

**1)** 2 : 9

**2)** 3 : 14

**3)** 4 : 13

**4)** 3 : 5

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**Q 17.** Nerolak paints mixes Green and White in the ratio 4 : 7 in a tank. However after mixing, the company finds that the resultant shade has less of Green and removes 24 liters of the mixture and adds an equivalent quantity of Green. The shade thus obtained has Green and White in the inverse ratio. How many liters of mixture was there initially in the tank?

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**Q 18.** The polynomial $p(x) = x^3 + ax^2 + bx + c$ has the property that the sum of its roots is three times the product of its roots which is equal to the sum of the coefficients of the polynomial. If $c = 4$, then what is the value of b?

**1)** −17

**2)** −21

**3)** 42

**4)** 38

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**Q 19.** A large plot is in the form of a rectangle of dimensions 42 m × 18 m. The 800 meters of iron wire for fencing is available. The field has to be divided into many identical smaller square plots, having integral sides (in meters), each of which is to be fenced with iron wire. Find the side (in meter) of each of the square plots such that the fencing iron wire that is left out is minimum.

**1)** 1

**2)** 2

**3)** 3

**4)** 6

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**Q 20.** How many of the five-digit numbers that are formed using the digits 1, 2, 3, 4 and 5 without repetition are divisible by the digit present in its units place?

**1)** 120

**2)** 96

**3)** 102

**4)** 104

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**Q 21.** The selling price of one apple is equal to the cost price of 7 bananas. The fruit vendor gains 40% from sales of apples and 60% from sales of bananas. If he sells one banana and one apple, then find his overall profit%.

**1)** 36(2/3)%

**2)** 43(1/3)%

**3)** 40%

**4)** 45%

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**Q 22.** How many integral values of 'x', which is a real number, satisfy the equations $x^2 - 4x - 96 < 0$ and $x^2 > 4$?