TCS SET 3

1. **The end of 1994 Rohit was half an old as his grandmother. The sum of years in which they were born is 3844. How old Rohit was at the end of 1999.**

   a. 48

   b. 49

   c. 53

   d. 104

   Answer: c. 53

   Explanation: let at the end of 1994 grandmother's age is x and Rohit's age x/2 then we can say....birth year of GM is =(1994-x) and Rohit is = (1994 - x/2) sum of years is 3844 i.e. (1994 - x) + (1994 - x/2) = 3884 => x = 96 i.e. GM age is 96 so Rohit age will be 96/2 = 48 years in 1994 age is 48, 1995 49, 1996 50, 1997 51, 1998 52, 1999 53. So answer should be 53 years.

2. **A mixture of 150 liters of wine and water contains 20% water. How much more water should be added so that water becomes 25% of the new**

   a. 10

   b. 11

   c. 12

   d. 14

   Answer: a. 10

   Explanation: Number of liters of water in 125 liters of the mixture = 20% of 150 = 1/5 of 150 = 30 liters

Let us Assume that another 'P' liters of water are added to the mixture to make water 25% of the new mixture. So, the total amount of water becomes (30 + P) and the total volume of the mixture becomes (150 + P).

Thus, (30 + P) = 25% of (150 + P) Solving, we get P = 10 liters

3. **In a rectangular region of 300X400 foot, there are 3 ants per square inch. how many ants(approximate value) are there in the square region??? [Gave the hint: 1foot=12inches]**

   a. 500 million

   b. 50 million

   c. 500000

   d. 5 million

   Answer: b. 50 million

   Explanation: 00*400 (foot), 300*400*12 (inches), 300*400*12*3 = 4320000 approximately 50 million ants

4. **What are the next three numbers in this series? 4, 6, 12, 18, 30, 42, 60, 72, 102, 108, ?**

   a. 138, 150, 180

   b. 108, 100, 140

   c. 150, 180

   d. 18, 10, 18

   Answer: a. 138, 150, 180

   Explanation: 138,150,180

   The series lists numbers that are flanked by two prime numbers.

   4 (3 and 5 are prime), 6 (5 and 7 are prime), 12 (11 and 13 are prime), 18 (17 and 19 are prime), 30 (29 and 31 are prime), 42 (41 and 43 are prime), 60 (59 and 61 are prime), 72 (71 and 73 are prime), 102 (101 and 103 are prime), 108 (107 and 109 are prime) thus 138 (137 and 139 are prime), 150 (149 and 151 are prime), 180 (179 and 181 are prime)

5. **Average of 3 numbers ABC is given as 48. Average of A,B,C,D is 46. Its given that E is having 3 more than D, then Average of B,C,D,E is 45. What is the score of A?**

a. 46

b. 48

c. 49

d. 47

Answer: d. 47

Explanation: average A+B+C= 48; A+B+C=3*48=144; average A+B+C + D= 46; A+B+C+D =4*46=184; D=40; GIVEN E=D+3=40+3=43; B+C+D+E=45*4= B+C+40+43=45*4; B+C=180-40-43; B+C=97; A+B+C=144; A+97=144; A=47

6. **Curious Elva asked her father what he would gift for her nineteenth birthday. Father replied that it would depend on the day of the week and be one of SUNglasses, MONeybag, FRIedcake, and SATchel. Please help Elva find the day of the week on 08-Jan-2029**

a. Monday

b. Tuesday

c. Thursday

d. Saturday

Answer: a. Monday

Explanation: Number of odd days upto 2000 = 0; From 2001 to 2028 = 28 + 7 = 35 = 0

(∵ 35/7 remainder zero).

From 2019 January 1 to 7 = 7 = 0; So 08 - Jan - 2029 falls on the same week day as 1-1-1 which is Monday.

7. **If a number is divided by 357 the remainder is 5, what will be the remainder if the number is divided by 17?**

a. 3

b. 5

c. 2

d. 1

Answer: b. 5

Explanation: To get the original number add the 357 with remainder 5, you will get 362. Then divide it by 17 you will get 5 as remainder.

8. **The fourteen digits of a credit card are to be written in the boxes shown above. If the sum of every three consecutive digits is 18, then the value of x is :**

   a. 1

   b. 4

   c. 3

   d. Cannot be determined

   Answer: c. 3

   Explanation: Let us assume right most two squares are a , b

   Then Sum of all the squares = 18 x 4 + a + b ..... (1)

   Also Sum of the squares before 7 = 18

   Sum of the squares between 7, x = 18 and sum of the squares between x , 8 = 18

   So Sum of the 14 squares = 18 + 7 + 18 + x + 18 + 8 + a + b (2)

   Equating 1 and 2 we get x = 3

9. **There is a set of 36 distinct points on a plane with the following characteristics: * There is a subset A consisting of fourteen collinear points. * Any subset of three or more collinear points from the 36 are a subset of A. How many distinct triangles with positive area can be formed with each of its vertices being one of the 36 points? (Two triangles are said to be distinct if at least one of the vertices is different)**

   a. 6776

   b. 1540

   c. 4774

   d. 7140

   Answer: a. 6776

   Explanation: The given data indicates that 14 points are collinear and remaining 22 points are non collinear.

A triangle can be formed by taking 1 points from 14 and 2 points from 22 (or) 2 points from 14 and 1 points from 22 (or) 3 points from 22 ⇒ 14C1×22C2+14C2×22C1+22C3= 6776

10. **In the town of Unevenville, it is a tradition to have the size of the front wheels of every cart different from that of the rear wheels. They also have special units to measure cart wheels which is called uneve. The circumference of the front wheel of a cart is 133 uneves and that of the back wheel is 190 uneves. What is the distance traveled by the cart in uneves, When the front wheel has done nine more revolutions than the rear wheel?**

    a. 4887

    b. 3990

    c. 3660

    d. 3455

    Answer: b. 3990

    Explanation: LCM of 133 and 190 is 1330.

    So to cover this distance, front wheel takes 10 rounds, and back wheel takes 7 rounds.

    So for 3 rounds extra, 1330 uneves distance has to be travelled.

    To take 9 rounds extra, 1330 × 3 = 3990 uneves has to be traveled.

11. **How many positive integers less than 4300 of digits 0-4?**

    a. 560

    b. 565

    c. 575

    d. 625

    Answer: c. 575

    Explanation: one digit no =4 (0 is not a positive integer) two digit no=4*5=20, three digit no=4*5*5=100, four digit no=3*5*5*5=375 (the possibility for 1,2,3 will come in the first position) four digit no=1*3*5*5 (the possibility of 4is fixed in the first position and then 0,1,2 is comes in second position) and the last digit is 4300 we include this number also. Answer is 4+20+100+375+75+1=575

12. **Length, Breadth and Height of a 3D figure is in the ratio 3:2:1. If the length is doubled and Breadth & Height are halved, then what is the % decrease in the volume of the solid?**

    a. Decreased by 15%

    b. Decreased by 18%

    c. Decreased by 30%

    d. Decreased by 50%

    Answer: d. Decreased by 50%

    Explanation: 50% decrease

    If original length, breadth & height are 3x, 2x and x respectively, then volume=3x*2x*x=6x^3

    With length doubled, breadth & height halved, new dimensions are 6x, x and x/2 respectively and volume=6x*x*x/2=3x^3. So % decrease in volume=100*(6x^3-3x^3)/6x^3=50

13. **In how many different ways can the letters of the word "LEADING" be arranged in such a way that the vowels always come together?**

    a. 360

    b. 720

    c. 480

    d. 5040

    Answer: b. 720

    Explanation: Given letters are A, E, I, D, L, N, G

    Of which AEI are vowels. Let us combine them into a single letter x. Now total letters are x, D, L, N, G

    These letter are arranged in 5! ways. But 3 vowels can arrange themselves in 3! ways. So total ways 5! x 3! = 720

14. **In a staircase, there are 10 steps. A child is attempting to climb the staircase. Each time, she can either make 1 step or 2 steps. In how many different ways can she climb the stair case?**

    a. 10

    b. 21

c. 36

d. 89

Answer: d. 89

Explanation: she can go by 1 steps-1 way that is choosing 1 two-step in 9 moves: 9C1 : 9 ways// 2 two-steps: choosing 2 two-steps in 8 moves: 8C2 = 28 ways// 3 two-steps 7C3 = 35 ways// 4 two-steps// 6C4 = 15 ways// 5 two-steps// which covers all the 10 stairs.. that means only one way 2 2 2 2 2 = 1 way// Adding all the ways: 1 + 9 + 28 + 35 + 15 + 1 = 89 ways

15. I bought a certain number of marbles at rate of 59 marbles for rupees 2 times M, where M is an integer. I divided these marbles into two parts of equal numbers, one part of which I sold at the rate of 29 marbles for Rs. M, and the other at a rate 30 marbles for Rs. M. I spent and received an integral number of rupees but bought the least possible number of marbles. How many did I buy?

a. 870

b. 102660

c. 1770

d. 740

Answer: b. 102660

Explanation: Let he bought x marbles. 59 marbles costs = Rs. 2M Therefore, x marbles costs = Rs. (2M * x) / 59. Since the marble is divided into 2 equal parts so the number x should be an even number. For first x/2 marbles, 29 marbles s.p. is = Rs. M Therefore, x/2 marbles s.p. = Rs. (M * x) / 58. For other x/2 marbles, 30 marbles s.p. is = Rs. M

Therefore, x/2 marbles s.p. = Rs. (M * x) / 60

Now we can\'t equate like [(M * x) / 58] + [(M * x) / 60] = (2M * x) / 59 because (M *x) will get cancel each side and of course 1/58 + 1/60 is not equal to 2/59

So here we don\'t need M and we can cancel it. After that we have, CP = 2x/59

For first x/2 marbles, SP = x/58 and for other x/2 marbles, SP = x/60

Now this CP and SP must be an integer (as per question). So we have to find a number x which will be divisible simultaneously by 59, 58 and 60. So we have to find the LCM of 59, 58, 60 which will turn out minimum value as 102660 and it is even as well. So the value of x will be 102660 minimum

16. **From the 50 liters of milk, 5 liters of milk is taken out and after it 5 liters of water is added to the rest amount of milk. Again 5 liters of milk and water is drawn out and it was replaced by 5 liters of water. If this process is continued similarly for the third time, the amount of milk left after the third replacement**:

    a. 32.33

    b. 36.33

    c. 36.45

    d. 33.45

    Answer: c. 36.45

    Explanation: General Formula:

    Final or reduced concentration = initial concentration
    x (1−amount being replaced in each operation total amount)n1
    amount being replaced in each operation total amountn

    where n is the number of times the same operation is being repeated. The "amount being replaced" could be pure or mixture as per the case. Similarly, "total amount" could also be either pure or mixture. Here amount being replaced denotes the quantity which is to be withdrawn in each time.

    Therefore, 50×(1−5/50)^3

    = 36.45 L

17. **A drinks machine offers three solutions – Tea, Coffee or Random but the machine has been wired up wrongly so that each button does not give what it claims. If each drink costs Rs. 50, what is the minimum amount of money that must be spent to determine with certainty the correct labeling of the buttons?**

    a. 100

    b. 150

    c. 50

    d. None

    Answer: c. 50

    Explanation: You have to put just 50rs.
    Put 50rs and push the button
    for Random. There are only 2

possibilities.
It will give either Tea or Coffee.
If it gives Tea, then the button
named Random is for Tea.
The button named
Coffee is for Random selection.
And the
button named Tea is for Coffee.
If it gives Coffee,
then the button named
Random is for
Coffee. The button named Tea is for Random selection. And
the button named Coffee is for Tea.
Thus, you can make out which button is for what by putting
just 50rs and pressing Random selection first.

18. In a potato race, 20 potatoes are placed in a line of intervals of 4 meters with the first potato 24 meters from the starting point. A contestant is required to bring the potatoes back to the starting place one at a time. How far would he run in bringing back all the potatoes?

a. 2400

b. 1400

c. 2480

d. 1240

Answer: c. 2480

Explanation: Given, total number of potatos = 20.
First potato 24 metres from the starting point. There are 4 meters in the intervals.
A contestant is required to bring the potatoes back to the starting
place one at a time. So for the first potato he has to travel 48 meters, for second 56 meters...
48,56,64.....20 terms.
a = 48, d= 8, n = 20.
Sum of n terms in A.P = $S_n=n/2[2a+(n-1)d]$
$S_{20}=20/2[2\times48+(20-1)8]$
$S_{20}=20/2[96+152]$
$S_{20}=10\times248=2480$
$\therefore$ 2480 meters he run in bringing back all the potatoes.

19. **At 12:00 hours jake starts to walk from his house at 6kms an hour. At 13:30 hours, paul follows him from jake's house on his bicycle at 8 kmph. When will jake be 3 kms behind paul?**

    a. 19:30

    b. 19:00

    c. 18:00

    d. 18:30

    Answer: a. 19:30

    Explanation: upto 13:30 jake covered 6*1.5=9km
    then paul need to be ahead of 3 km.so he go 12km.
    their relative speed is 2km per hour.(same direction).
    so 12km divided by 2 is 6hrs.
    hence from 13:30hrs ,6hrs is added.so answer is 19:30 hours.
    ANS:19:30 hrs

20. **A can complete a piece of work in 8 hours, B can complete in 10 hours and C in 12 hours. If A,B, C start the work together but A laves after 2 hours. Find the time taken by B and C to complete the remaining work.**

    a. 4 (1/11) hours

    b. 2(1/11) hours

    c. 2(8/11) hours

    d. 2 hours

    Answer: b. 2(1/11) hours

    Explanation: A,B,C 1 hour work is=1/8+1/10+12= 37/120
    A,B,C work together for 2 hours, so A,B,C 2 hours' work is: (37/120)*2=37/60
    remaining work=1-37/60=23/60 (23/60 work is done by B and C together)
    B,C 1 hour work is= 1/10+1/12=11/60
    23/60 hours work done by B,C= (11/60)* (60/23)=11/23
    so... ans is: 2(1/11)

21. **Suresh Raina and Gautam Gambhir after a scintillating IPL match decide t travel by cycle to their respective villages. Both of them start their journey travelling in opposite directions. Each of their speeds is 6 miles per hour. When they are at a distance of 50 miles, a housefly starts flying from Suresh Raina's cycle towards Gautam Gambhir at a relative speed of 17 miles per hour with respect to Raina's speed. What will be the time taken by housefly to reach Gambhir?**

a. 10 hrs

b. 15 hrs

c. 20 hrs

d. 25 hrs

Answer: a. 10 hrs

Explanation: Fly speed is 17 kmph w.r.t to Suresh as fly is moving in opposite direction to

Suresh, its
actual speed is 17 - 6 = 11.
Now relative speed of fly and Gambhir = 11 - 6 = 5 kmph
So fly takes = 5011−6 = 10 Hrs

22. **A drinks machine offers three solutions – Tea, Coffee or Random but the machine has been wired up wrongly so that each button does not give what it claims. If each drink costs Rs. 50, what is the minimum amount of money that must be spent to determine with certainty the correct labeling of the buttons?**

a. 100

b. 150

c. 50

d. None

Answer: c. 50

Explanation: You have to put just 50rs.
Put 50rs and push the button
for Random. There are only 2
possibilities.
It will give either Tea or Coffee.
If it gives Tea, then the button
named Random is for Tea.
The button named
Coffee is for Random selection.
And the
button named Tea is for Coffee.
If it gives Coffee,
then the button named
Random is for
Coffee. The button named Tea is for Random selection. And
the button named Coffee is for Tea.

Thus, you can make out which button is for what by putting
just 50rs and pressing Random selection first.

23. **The marked price of coat was 40%less than the suggested retail price. Eesha purchased the coat for half of the marked price at the 15th anniversary sale. What percent less than the suggested retail price did Eesha pay?**

    a. 60%

    b. 20%

    c. 70%

    d. 30%

    Answer: c. 70%

    Explanation: suppose retail price = 100
    so the market price will be = 60
    as given coat purchased = half f d market price = 30
    so its clear Isha paid 70% less than retail price.

24. **A man sold 12 candies in 10$ had loss of b% then again sold 12 candies at 12$ had profit of b% find the value of b.**

    a. 9

    b. 9.09

    c. 10

    d. 11

    Answer: d. 11

    Explanation: - Let the CP be \'x\' then:
    (x-10)*100/x = b% ---------->1 (12- x) * 100 /x = b% ------->2
    (x-10)*100 / x = (12-x)*100 / x
    x-10 = 12-x
    x = 11
    So by Submitting value of x into one of above question (1 or 2) we get b%
    which is 9.09 or 9 Approx

25. **In a 3*3 square grid comprising 9 tiles each tile can be painted in red or blue color. When the tile is rotated by 180 degree, there is no difference which can be spotted. How many such possibilities are there?**

    a. 16

b. 32

c. 64

d. 256

Answer: b. 32

Explanation: ans grid has to be rotated at 180 degrees.
hence,
11=33
12=32
13=31
21=23
22=22
31=13
32=12
33=11
cell 11-33 can be altered in 2 ways (as thr are 2 colours)
cell 12-32 can be altered in 2 ways
cell 13-31 can be altered in 2 ways
cell 21-23 can be altered in 2 ways
and , cell 22 can be altered in 2 ways
, so
2X2X2X2X2 = 32.

26. How many prime numbers are there which are less than 100 and greater than 3 such that they are of the following forms
4x + 1
5y - 1

a. 29, 89

b. 49, 69

c. 29, 49

d. 29, 89

Answer: a. 29, 89

Explanation: Let the number be N.
So N = 4x + 1 = 5y - 1
$\Rightarrow x=5y-2/(4)$
y = 2 satisfies the equation.
So minimum number satisfies both the equations is 9 and general format of the numbers which satisfies the equation

= k. LCM (4, 5) + 9 = 20k + 9.
Now by putting values 1, 2, 3 . . . . for k
we get 29, 49, 69, 89. Of which only 29, 89 are primes.

27. If ab64ab is divisible by 12, then what is the least possible value of a+b ?

a. 4

b. 5

c. 6

d. 7

Answer: d. 4

Explanation: Condition for divisibility by 3--
The sum of digits of number must be divisible by 3.
i.e a+b+6+4+a+b = 0 mod 3
=> 10 + 2(a+b) = 0 mod 3
=> 1 + 2(a+b) = 0 mod 3 (10 = 1 mod 3)
=> 2(a+b) = -1 mod 3
=> 2(a+b) = 2 mod 3
=> a+b = 1 mod 3
So, a+b must be of the form 3n + 1 for some positive integer n.
Max value of (a+b) is 18 as a and b can take values upto 9 since they are digits.
The possible values are 1,4,7,10,13,16.
2. Condition for divisibility by 4--
For divisibility by 4, Last two digits must be divisible by 4.
i.e 10a+b = 0 mod 4
=> 2a + b = 0 mod 4 (Since, 8a = 0 mod 4)
So, 2a + b can be 4,8,12,16,20,24,28.
Combining these,we get
a + b = 3n +1
2a + b = 4k
The smallest values which satisfies these
two equation is a = 4 ,b = 0.
So, the minimum sum of a + b is 4

28. In a particular year the month of January had exactly 4 Thursdays and 4 Sundays, on which day of the week, Jan 1 occurs that year?

a. Saturday

b. Sunday

c. Wednesday

d. Monday

Answer: d. Monday

Explanation: as there are 4 full weeks i.e. 28 days.
So, everyday occur min 4 times, then remaining 3 days (as Jan has 31 days) will be Monday, Tuesday, Wednesday.
So on 31st Jan comes Wednesday.
So 1st Jan will be Monday

29. **Four parallel lines are drawn parallel to one side of an equilateral triangle such that it cuts the other two sides at equal intervals. The area of the largest segment thus formed is 27msqr. Find the area of the triangle?**

a. 100

b. 75

c. 81

d. 54

Answer: b. 75

Explanation: Area of Trapezoid= ((a+b)*h))/2(where a and b are length of parallel sides)
Now Since side is divided in 5 parts therefore, length of one interval=a/5
Now use Sin60 and to calculate the height of trapezoid (i.e. a root 3/10). and cos60 to calculate the base of the triangle whose hypotenuse is a/5..(i.e. will be a/10);
We get b= a-(a/10+a/10)
b= 4a/5
now equate the area of trapezoid with 27..
Hence area of equilateral triangle is 75 sqm

30. **10 years ago 10 people age was33. After 3 years a person of age 40 dies. After another 3 years another person of 40years dies. After another 3 years another person of 27years dies. Find the present average age?**

a. 43

b. 44

c. 45

d. 46

Answer: b. 44

Explanation: 10 year ago 10 people= 33
10 year ago total age=330
after 3 year 1 person with age 40 died = ie take his age as 37 before 3 years
similarly for next 2 persons ; consider as 34 (40-6) and as 18(27-9) in 6 and 9 years ago(
i.e. 37+34+18=89) 10 years ago age of 7 people =330-89=241
now consider present age 7*10=70+241=311
now average = 311/7 = 44.43 (ans)