TCS NQT Aptitude Paper

1. A two digit number is 18 less than the **square of the sum of its digits**. How many such numbers are there?
(1) 1
(2) 2
(3) 3
(4) 4

Ans: Option 2

Take N = 10a+b.

Given that, $(10a+b)+18 = K^2 = (a+b)^2$ Given
number = $K^2-18 = (10a+b)$

That means, when we add 18 to the given number it should be a perfect square. So K^2takes the following values. 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, ...
1 to 16 are ruled out as if we subtract 18 from them, the resulting number is a single digit number. Now 25 - 18 = 7

36 -18=18

49 -18=31

64 -18=46

81 -18=63

100 -18=82

121 -18=103 Now

63, 82 satisfies.

2. A two digit number is 18 less than the**sum of the squares of its digits.**How many such numbers are there?
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(2) 2
(3) 3
(4) 4

Ans: Option 2

Only 47 and 67 satisfy the condition

3. For real number x, int(x) denotes integer part of x.int(x) is the largest integer less than or equal to x.int(1,2)=1,int(-2,4)=-3. Find the value of int(1/2)+int(1/2+100)+int(1/2+2/100)+....+int(1/2+99/100) Sol: int (1/2) = 0

int (1/2 + 100) = 100

into (1/2 + 2/100) = 0

.....

int (1/2 + 50/100) = 1

int (1/2 + 51 /100) = 1

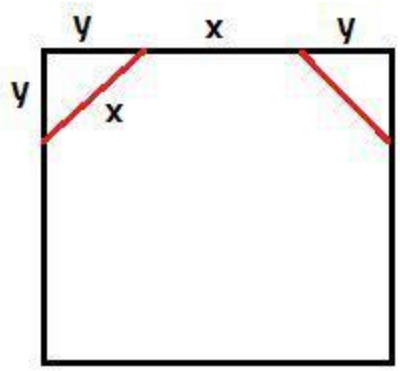
.....

int (1/2 + 99/100) = 1

So 100 + 1 + 1 + ...50 times = 150

4. Given a square of length 2m. Its corners are cut such that to represent a regular octagon. Find the length of side of octagon

Sol:



Let x is the side of the octagon and x + 2y is the side of the square.

In the given octagon,

In the given octagon, $y^2 + y^2 = x^2 \Rightarrow 2y^2 = x^2 \Rightarrow y = \frac{x}{\sqrt{2}}$

But $\frac{x}{\sqrt{2}} + x + \frac{x}{\sqrt{2}} = 2$

$\Rightarrow \sqrt{2}x + x = 2$

$\Rightarrow x = \frac{2}{\sqrt{2}+1} = \frac{2}{\sqrt{2}+1} \times \frac{\sqrt{2}-1}{\sqrt{2}-1} = 2\left(\sqrt{2}-1\right)$

5. Find the number of ways a batsman can score a double century only in terms of 4's & 6's? Assume the batsman scored x 4's and y 6's.

4x + 6y = 200

⇒

2

x

+

3

y

=

100

⇒2x+3y=100

⇒

x
=
100
−
3
y
2
=
50
−
3
2
y
⇒x=100−3y2=50−32y

As x is an integer, y should be a multiple of 2.
If
y = 0, x = 50
y = 2, x = 47
y = 4, x = 44
...
y = 32, x = 2

So total ways are (32-0)/2 + 1 = 17 (if 0 6's are possible) otherwise 16

6. 5000 voted in an election between two candidates.14% of the votes were invalid.The winner won by a margin approximately closer to 15%.Find the number of votes secured by the person
Invalid Votes = 14 % (5000) = 700
Valid Votes = 5000 - 700 = 4300 = R (say)
Assume the looser got 'L" votes and winner got "W" votes.
W-L=15%(R)
W+L=R
Solving we get W = 57.5% and L = 42.5%
So Winner got 57.5%(4300) = 2472

7. There are 100 wine glasses. I offered my servant to 3 paise for every broken glass to be delivered safely and forfeit 9 paisa for every glass broken at the end of day. He recieved Rs.2.40 .how many glass did he break.
a. 20 b. 73 c. 5 d. 8
If a glass has been broken, he has to loose 3 paisa + 9 paise = 12
paise Assume K glasses got broken
100 x 3 - 12 x K = 240
⇒

K
=
5
⇒K=5

8. A is 20 percent more efficient than B. If the two person can complete a piece of work in 60 days.in how many days. A working alone can complete the work
a. 80 b. 90 c. 100 d. 110
As A is 20% more efficient than B, If B's per day work is 100 units then A's 120.
Both persons together completes (100 + 120) units = 220 units a day.
They took 60 days to complete the work. So total work = 60 x
220 If A alone set to complete the work, he takes =
60
×
220
120
=
110
60×220120=110
days

9. A property was originally on a 99 years lease and two thirds of the time passed is equal to the four fifth of the time to come.how many years are there to go.
a. 45 b. 50 c. 60 d. 55
Assume x years have passed and y years to go
Given
2
3
x
=
4
5
y
23x=45y

⇒
x
=
3
2
×

$\frac{4}{5}y = \frac{6}{5}y$

$\Rightarrow x = 32 \times 45y = 65y$

But x + y = 99

So

$\frac{6}{5}y + y = 99$

$65y + y = 99$

Solving we get y = 45 years

10. In how many different ways can the letters of the word "LEADING" be arranged in such a way that the vowels always come together https://www.freshersnow.com/placement-papers-download/ a. 360

b. 720

c. 480

d. 5040

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

11. There is a plane contains 32 points.all the 32 points have equal distance from point x. which of the following is true .

a. all 32 points lie in circle

b. the distance from x to all 32 points is less than the distance between each other c. both a and b

d. none of these

Sol: Option 3

X must be the center of the circle and 32 points are on the circumference. So Option A is correct

Number of diagnols of a regular polygon = n

(
n
−
3
)
2
n(n−3)2

So for a polygon of 32 sides, Number of diagnols = 464. Now the minimum distance between any two points =
2
π
r
32
=
11
56
r
2πr32=1156r

Now total lengh of all the distances from 32 points =
2
π
r
2πr
+ Sum of the lengths of all the 464 diagnols.
Sum of the lengths of x to all the 32 points = 32 radius = 32r
But the 464 diagnols have 16 diameters connecting 2 oposite points connecting via center. So Sum of the lengths of distances from point to point is clearly greater than sum of the length from x to all 32 ponts. Option B is correct
Correct Option 3

12. When asked what the time is,a person answered that the amount of time left is 1/5 of the time already completed.what is the time.
1. 8 pm
2. 8 am
3. 12 pm
4. 12 am

Sol: A day has 24 hrs. Assume x hours have passed. Remaining time is (24 - x)
24
−
x

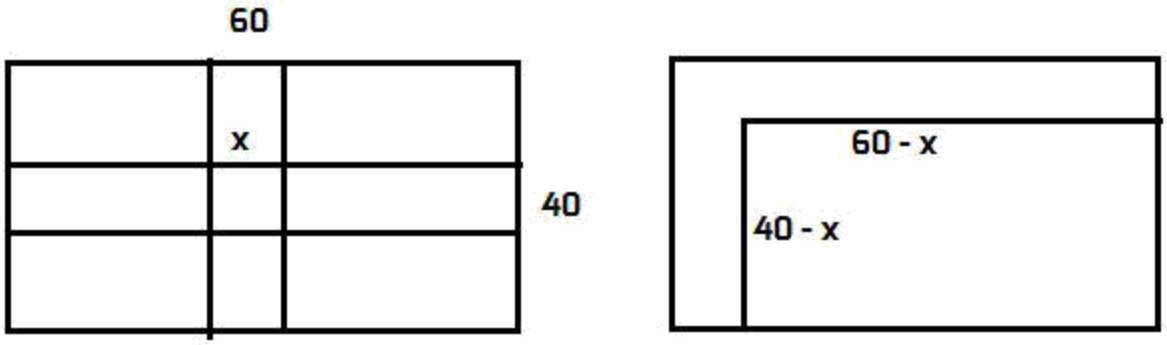
=
1
5
x
⇒
x
=
20
24−x=15x⇒x=20

Time is 8 PM

13. Perimeter of the backwheel =9 feet,front wheel=7 feet on a certain distance ,the front wheel gets 10 revolution more than the back wheel.what is the distance
Let the backwheel made x revolutions then front wheel makes x + 10
x x 9 = (x + 10) x 7
x = 35
So distance traveled = 35 x 9 = 315

14. There are 2 groups named brown and red. They can n't marry in the same group. If the husband or wife dies then the person will revert to their own group. If a person is married then the husband will have to change his group to his wife's group. Children will own the mother's group. If man is red then his mother's brother belong to which group if he is married
a. red b.
brown
c. red and
brown d. none
Option: b
If a man is Red, his mother must be red, his mothers brother also red but after marriage, he gets converted to Brown.

15. A rectangular park 60 m long and 40 m wide has concrete crossroads running in the middle of the park and rest of the park has been used as a lawn.if the area of the lawn is 2109 sq.m,then what is the width of the road.
a. 2.91 m
b. 3m
c. 5.82 m
d. none
Option : B



Let us shift the path to the left hand side and top. This does not change the area of the lawn.
Now lawn area = (60 - x) (40 - x)
for x = 3, we get lawn area = 2109.