# CAT Model Paper 11 Questions and Answers with Explanation Part 1



1. $x!$ ends with n zeroes. $(x+1)!$ ends with $n+2$ zeroes. $24 \leqslant x \leqslant 626$ . How many values are possible for x?

(A) 25

(B) 22

(C) 23

(D) 20

Answer: D

Solution

If 24! Ends in n zeroes, 25! will end in $(n+2)$ zeroes.

Generalizing this to all multiples of 25, they satisfy this condition: If $(x)!$ ends with n zeroes then $(x+1)!$ ends with $(n+2)$ zeroes.

However, 124! Ends in n zeroes, 125! Will end in $(n+3)$ zeroes.

Generalizing this to all multiples of 125, they satisfy this condition: If $(x)!$ ends with n zeroes then $(x+1)!$ ends with $(n+2)$ zeroes. Infect, that end with $(n+3)$ or $(n+4)$ zeroes.

Therefore, the number of favourable cases between 24 to 626 can be represented as:

(Number of multiples of 25 – Number of Multiples of 125)

$$25-5=20$$

2. If $A>11, B>21, C>30, D>40$ and $E>50$, then how many positive integral solution exist for $+B+C+D=2012$ ?

(A) $1859\ C_5$

(B) $2012\ C_4$

(C) $2012\ C_5$

(D) $1859\ C_4$

Answer: D

Solution:

$$A + B + C + D = 2012\,(A > 11, B > 21, C > 30, D > 40, E > 50)$$

This is a lower limit similar → different question.

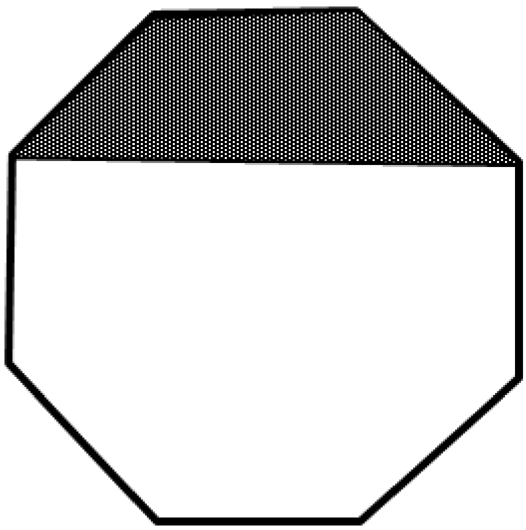
So, we assign the minimum values that can be taken by each of A, B, C, D and E and reframe the equation!

$A + B + C + D = 1855$ (Assigning 12 to A, 22 to B, 31 to C, 41 to D and 51 to E)

Using the $1 - 0$ method:

Required answer $= 1859\ C_4$

3. The figure below is a regular octagon. What fraction of its area is shaded?





(A) $\frac{1}{3}$

(B) $\frac{1}{4}$

(C) $\frac{1}{5}$

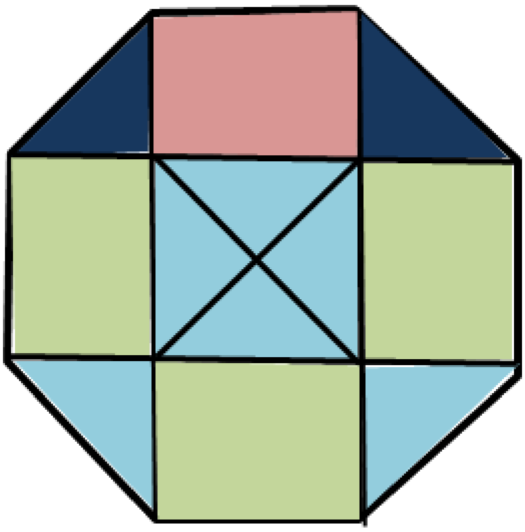
(D) $\frac{3}{8}$

Answer: B

Solution:

The diagram shows how the octagon can be divided into 4 congruent rectangles and 8 congruent triangles.

Let R represent the area of a rectangle and let T represent the area of a triangle. Then the ratio of the shaded region to the area of the entire octagon is $\frac{R+2T}{4R+8T}=\frac{1}{4}$





5. In an election, BJP received 60 % of the votes and congress received the rest. If BJP won by 24 votes, how many people voted?

(A) 120

(B) 60

(C) 72

(D) 100

Answer: A

Solution:

If BJP received 60 % of the votes this implies that congress received 40 % of the total number of votes. The difference between them $20\%$ , represents 24 votes. Therefore, the total number of votes cast was $5 \times 24 = 120$ .

6. Find the sum of given series $S_n = 4 + 44 + 444 + 4444 \ \ldots \ n$ terms.

(A) $\frac{4}{9}\left(\frac{10}{9}\left(10^{(n-1)^{-1}}\right) -\right.$

(B) $\frac{4}{9}\left(\frac{10}{9}\left(10^{n-1}\right) -\right.$

(C) $\frac{4}{9}\left(10\left(10^{n-1}\right) -\right.$

(D) $\frac{4}{9}\left(10^{n-1}\right)^{-n}$

Answer: B

Solution:

Reverse Gear Approach

Assume $n = 1$ , then $s_1 = 4$

Now put $n = 1$ in options. Eliminate those options, where you are not getting 4.

Only option (b) will give 4.

7. In a 4000 meter race around a circular stadium having a circumference of 1000 meters, the fastest runner and slowest runner reach the same points at the end of the 5th minute, for the first time after the start of the race. All the runners have the same starting point and each runner maintains a uniform speed throughout the race. If the fastest runner runs at twice the speed of the slowest runner, what is the time taken by the fastest runner to finish the race?

(A) 20 min

(B) 15 min

(C) 10 min

(D) 5 min

Answer: C

Solution:

The ratio of the speeds of the fastest and slowest runners is $2:1$ . Hence, they should meet at only one point on the circumference i.e.. the starting point (As the difference in the ratio in reduced form is 1) . For the two of them to meet for the first time, the faster should have completed one complete round over the slower one. Since, the two of them meet for the first time after 5 min, the faster one should have completed 2 rounds (i.e.. 2000 m) and the slower one should have completed 1 round (i.e.. 1000 m) in this time. Thus, the faster one would complete the race (i.e.. 4000 m) in 10 min.