CS Ninja Aptitude questions - Set 1 (Standard section)

1) A^B means A raised to the power B. If f(x) = ax^4 - bx^2 + x + 5 and f(-3) = 2, then f(3) = ?

a. 3

b. 8

c. -2

d. 1

Answer: b

Explanation:

$f(-3) = a(-3)^4 - b(-3)^2 + (-3) + 5 = 81a - 9b + 2 = 2$ So $81a - 9b = 0$,

$f(3) = a(3)^4 - b(3)^2 + (3) + 5 = 81a - 9b + 8$

Substituting the value of $81a - 9b = 0$ in the above we get $f(3) = 8$

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2) 1/4 of the tank contains fuel. When 11 liters of the fuel is poured into the tank, the indicator rests at the 1/2 mark. Find the capacity of the tank in liters.

a. 44

b. 36

c. 6

d. 8

Answer: a

Explanation:

Let the capacity of the tank be x liters.

Given, 1/4 of x + 11 = 1/2 of x

By solving we get the x value as 44 liters.

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3) You have been given a physical balance and 7 weights of 47, 46, 43, 48, 49, 42, and 77 kgs. Keeping weights on one pan and object on the other, what is the maximum you can weigh less than 178 kgs.

a. 172

b. 174

c. 175

d. 177

Answer: b

Explanation:

The maximum weight that can be weighed less than 178 kgs is 174 (48 + 49 + 77 = 174 kgs).

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4) How many 6-digit even numbers can be formed from the digits 1, 2, 3, 4, 5, 6 and 7 so that the digits should not repeat and the second last digit is even?

a. 320

b. 6480

c. 2160

d. 720

Answer: d

Explanation:

To form 6-digit even number, the last digit should be an even number so 3 ways (2, 4, or 6) to fill the last digit and second last digit also should be even for which it will take 2 ways to fill.

The last two digits are filled in 6 ways(2 x 3 = 6 ways). The rest of the 4 digits can be filled in 5P4 ways i.e. 120 ways. Hence altogether to fill 6-digit even number = 120 * 6 = 720 ways.

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5) Out of a group of swans, 7/2 times the square root of the total number are playing on the shore of the pond. The remaining 2 are inside the pond. Find the total number of swans.

a. 16

b. 25

c. 4

d. 9

Answer:a

Explanation:

Let the number of swans = x^2

$x^2 = 7x/2 + 2$ --> $x^2 = (7x + 4)/2$

$2x^2 = 7x + 4$, --->$2x^2 - 7x - 4 = 0$

The roots of x are 4, -1/2.Here -1/2 is not possible, so the x value will be 4.

The total number of swans is x^2i.e 16.

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6) In a village, every weekend, three-eighth of the men and one-third of the women participate in a social activity. If the total number of participants is 54, and out of them 18 are men then the total number of men and women in the village is:

a. 180

b. 156

c. 204

d. 228

Answer: b

Explanation:

3/8th of men and 1/3rd of women participated and given that the total participants are 54.

Out of total participants 54, 18 were men and the rest will be women (54-18 = 36 women). From this, we can say that --> 3/8 * men = 18, therefore men = 48. And 1/3 of women = 36 --> women = 108.

The total number of men and women in the village is 156.

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7) If M is 30% of Q, Q is 20% of P, and N is 50% of P, then M/N = ?

a. 6/5

b. 4/3

c. 3/25

d. 3/250

Answer: c

Explanation:

Q = 20% of P

M = 30% of Q ---> 30% of (20% of P) ---> 30/ 100 * 20/100 * P --> 6/100 * p

N = 50% of P --> 5/10 * P

M/ N = (6/100 * P) / (5/10 * P) = 6/50 = 3/25

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8) There are 20 persons among whom two are sisters. Find the number of ways in which we can arrange them around a circle so that there is exactly one person between two sisters? Please note that the exact position on the circle does not matter (no seat numbers are marked on the circle), and only the relative positions of the people matter.

a. 2! * 19!

b. None of these

c. 2 * 18!

d. 18!

Answer: c

Explanation:

Fix the position of two sisters.Hence there are only 18 people left

So there are 18 ways in which a person can sit between the two sisters. Now if we swap the bothers we get another 18 ways.

So hence we have a total of = 2 * 18 combinations

Consider the group of three people(two brothers and the person between them) as a single entity.

we have another 17 people left so there are 18 entities to be arranged in total.

Arranging 18 entities around a circle can be done in (18-1)! = 17! ways

Total no of ways = 2 * 18 * 17! = 2 * 18!

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9) Find the length of the longest pole that can be placed in an indoor stadium 24m long, 18m wide and 16m high.

a. 36m

b. 34m

c. 30m

d. 25m

Answer: b

Explanation:

Length of the longest pole = diagonal of rectangular indoor stadium

= ?(l+b+h)

= ?(24+18+16)

= ?(576+324+256)

= ?1156

= 34 m

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10) Of a set of 30 numbers, the average of first 10 numbers is equal to the average of last 20 numbers. Then the sum of the last 20 numbers is:

a. Sum of first ten numbers

b. 2 X sum of the first ten numbers

c. Cannot be determined with the given data

d. 2 x sum of last ten numbers

Answer: b

Explanation:

Average = (sum of n numbers)/(n)

(sum of first 10 numbers)/10 = (sum of last 20 numbers)/20

Hence, (sum of last 20 numbers) = 2*(sum of first 10 numbers)

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11) Thomas takes 7 days to paint a house completely whereas Raj would require 9 days to paint the same house completely. How many days will it take to paint the house if both of them work together (give answers to the nearest integer)?

a. 4 days

b. 2 days

c.5 days

d.3 days

Answer: a

Explanation:

Work done by Thomas in a day = 1/7

Work done by Raj in a day = 1/9

Work done by both in a day = 1/7 +1/9 =16/63

Days required if they both work together = 63/16 = 3.9 = 4 days

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12) The University of Vikramasila has enrolled nine Ph.D. candidates: Babu, Chitra, Dheeraj, Eesha, Farooq, Gowri, Hameed, Iqbal, Jacob.

- Farooq and Iqbal were enrolled on the same day as each other, and no one else was enrolled that day.

- Chitra and Gowri were enrolled on the same day as each other, and no one else was enrolled that day.

- On each of the other days of hiring, exactly one candidate was enrolled.

- Eesha was enrolled before Babu.

- Hameed was enrolled before Dheeraj.

- Dheeraj was enrolled after Iqbal but before Eesha.

- Gowri was enrolled after both Jacob and Babu.

- Babu was enrolled before Jacob.

Who were the last two candidates to be enrolled?

a. Eesha and Jacob

b. Babu and Chitra

c. Gowri and Chitra

d. Babu and Gowri

Answer: c

Explanation:

1. Easha < Babu

2. Hameed < Dheeraj

3. Iqbal < Dheeraj < Easha

4. Jacob/Babu < Gowri

5. Babu < Jacob

from 1 and 5,Eashawas before Babu and Jacob so she cannot be in the last two. Option B ruled out

from 4 and 5, babu is before Jacob and Gowri so he cannot be in the last two. Options a, d ruled out.

So option c is correct.

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13) In a certain city, 60 percent of the registered voters are Party A supporters and the rest are Party B supporters. In an assembly election, if 75% of the registered Party A supporters and 20% of the registered Party B supporters are expected to vote for Candidate A, what percent of the registered voters are expected to vote for Candidate A?

a. 20

b. 60

c. 75

d. 53

Answer: d

Explanation:

let there be x number of registered voters

60% are Party A supporters = 60% of x

40% are Party B supporters = 40% of x

Out of 60%, 75% voted for party A = 75%(60% of x) = 18x/40

Out of 40% ,20% voted for party B = 20%(40% of x) = 8x/100

=18x/40+8x/100=106x/200

Percentage of registered voters expected to vote for A = 106x/200*100 = 53% of x

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14) When 100 is to be successively divided by 6, 3, 4, first divide 100 by 6. Then divide the quotient 16 by 3. Then divide the quotient 5 by 4.

A number when successively divided by 5, 3, 2 gives the remainder of 0, 2 and 1 respectively in that order. What will be the remainders when the same number is divided successively by 2, 3 and 5 in that order?

a. 4, 1, 2

b. 1, 0, 4

c. 2, 1, 3

d. 4, 3, 2

Answer: b

Explanation:

Let us assume the number to be N. Now, N is first divided by 5 and leaves a remainder 0. So, N = 5X+0

Then the quotient (X) is divided by 3 and leaves a remainder of 2. So, X = 3Y+2

Again, the quotient (Y) is divided by 2 and leaves a remainder of 1. So, Y = 2Z+1

Now, let us assume that Z = 1, then Y = 3, X = 11, N=55

Now, 55/2 remainder is 1, 27/3 remainder is 0 and 9/5 remainder is 4. So the answer is 1, 0, 4

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15) Professor Nitwit obtains a hash number of a given positive integer > 3 as follows. He subtracts 2 from the number (to get the new number),and multiplies the new number by 2 to get a term. He repeats this with the new number (to get newer numbers and terms) until the number becomes 2 or 1. The hash is defined as the sum of all the terms generated in this process.

For example, with the number 5, he multiplies (5-2 =3) by 2 to get the first term 6. He multiplies (3-2=1) by 2 to get the second term 2. As the number has become 1, he stops. The hash is the sum of the two terms (6+2) or 8.

If professor Nitwit is given 3 numbers 4, 9 and 13, what is the sum of the hash numbers he obtains for the three numbers?

Explanation:

We need to continuously subtract 2 from the given number until it becomes 1 or 2 and then we multiply each of those numbers by 2. Following the same,

For example, as given for 5: (3+ 1) 2 = 8

Now, let us apply the same for 4, 9, 13.

4 : (2) x 2 = 4

9 : (7 + 5 +3+ 1) 2 = 32

13 : (11+ 9+ 7+ 5+ 3+ 1) 2 = 72

Sum of the hash numbers = 4 + 32 + 72 = 108

TCS Ninja aptitude questions - set 2 (Standard section)

1.On a 26 question test, five points were deducted for each wrong answer and eight points were added for each correct answer. If all the questions were answered, how many were correct, if the score was zero?

a. 10

b. 12

c. 11

d. 13

Ans: a

Explanation:

Let x be the number of questions correct and therefore, (26 - x) will be the wrong number of questions,

8x - 5(26-x) = 0 --> 8x - 130 + 5x =0

13x = 130, x =10

Hence 10 questions were correct.

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2. Jake can dig a well in 16 days. Paul can dig the same well in 24 days. Jake, PaulandHari together dig the well in 8 days. Hari alone can dig the well in

a. 96 days

b. 48 days

c. 32 days

d. 24 days

Ans: b

Explanation:

Let the total work to be done is 48 meters(LCM of 16, 24 and 8). Now Jake can dig (48/16) - 3 meters, Paul can dig (24/12) - 2 meters a day. Now all of them combined dug in 8 days so per day they dug 48/8 = 6 meters. So Of these 8 meters, Hari capacity is 1 meter.So he takes 48 /1 = 48 days to complete the digging job.

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3. Mark told John "If you give me half your money I will have Rs.75". John said, "if you give me one-third of your money, I will have Rs.75/- How much money did John have?

a. 45

b. 60

c. 48

d. 37.5

Ans: b

Explanation:

Let the money with Mark and John are M and J respectively.

Now

M + J/2 = 75

M/3 + J = 75

Solving we get M = 45, and J = 60.

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4. The value of a scooter depreciates in such a way that its value of the end of each year is 3/4 of its value of the beginning of the same year. If the initial value of the scooter is Rs.40,000, what is the value at the end of 3 years?

a. Rs.13435

b. Rs.23125

c. Rs.19000

d. Rs.16875

Ans: d

Explanation:

Every year it depreciates 3/4thof the previous year. So (3/ 4 x (3/4 x (3/4 of 40,000))) = 3*3*3*625 = 16875. Hence the value after 3 years is Rs. 16875

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5. A man has a job, which requires him to work 8 straight days and rest on a ninth day. If he started work on Monday, find the day of the week on which he gets his 12th rest day.

a. Thursday

b. Wednesday

c. Tuesday

d. Friday

Ans: b

Explanation:

He works for 8 days and takes rest on the 9th day. So On the 12th rest day, there are 9 x 12 = 108 days passed. Number of odd days = (108 - 1) / 7 = 107 / 7 = 2. So the 12th rest day is Wednesday.

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6. George can do a piece of work in 10 days,Paul in 12 days and Hari in 15 days. They all start the work together, but George leaves after 2 days and Paul leaves 3 days before the work is completed. In how many days is the work completed?

a. 5

b. 6

c. 9

d. 7

Ans: d

Explanation:

Let the work be 60 units(LCM of 10, 12 and 15). If Paul worked for 3 days, and the remaining days of work are x days, total days to complete the work be x + 3 days.Now George's is 60/10 = 6, Paul is 5, Hari is 4.

(6 + 5 + 4) 2 + (5 + 4) (x - 3) + 5 x 3 = 60. On solving we get x = 4. So total days to complete the work is 7 days.

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7. How many arrangements will start and end with a vowel for TOGETHER?

a. 1060

b. 1080

c. 2024

d. 1050

Ans: a

Explanation:

No. of ways to put a vowel on start and end = 3 (i.e O..E, E..O, E..E). The number of ways to arrange other 6 letters = 6!/2! = 360 (letter T is two times). Total number of arrangements = 3*360 = 1080.

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8. In 4 years, Raj's father age is twice as raj, Two years ago, Raj's mothers age twice as raj. If Raj is 32 years old in eight years from now, what is the age of Raj's mother and father?

a. 32,34

b. 51,50

c. 32,36

d. 52,46

Ans: d

Explanation:

Raj present age = 32 8 = 24.

After 4 years Raj's age is 28. and Raj's father's age is 28 x 2 = 56, and his present age is 52.

Two years ago, Raj's age is 22. and his mothers age is 22 x 2 = 44. His mothers present age = 46

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9. A call center agent has a list of 305 phone numbers of people in alphabetic order of names (but she does not have any of the names). She needs to quickly contact Deepak Sharma to convey a message to him. If each call takes 2 minutes to complete, and every call is answered, what is the minimum amount of time in which she can guarantee to deliver the message to Mr. Sharma?

a. 18 minutes

b. 610 minutes

c. 206 minutes

d. 34 minutes

Ans: a

Explanation:

The call center calls the middle no. i.e. (305/2) = 152.5 say 152 and asks them their name to get an idea of whether to go to up or downside of 152 no directory and suppose person replies some name.The starting letter of the name will suggest the call center to decide to weather go up or down the name list.

So the process goes like >305->152-->76-->38-->19-->9-->4-->2-->1, the minimum time = 9*2 = **18 mins**.

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10. In how many ways a team of 11 must be selected from 5 men and 11 women such that the team must comprise of not more than 3 men?

a. 1565

b. 2456

c. 1243

d. 2256

Ans: d

Explanation:

The team may consist of 0 men + 11 women, 1 men + 10 women, 2 men + 9 women, or 3 men + 8 women.So Number of ways are = 11C11+5C111C10+5C211C9+5C311C8 = 2256 ways.

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11. Given that 0 < a < b < c < d, which of the following the largest?

a. (c+d) / (a+b)

b. (b+d) / (a+c)

c. (b+c) / (a+d)

d. (a+d) / (b+c)

Ans: a

Explanation:

Let's assume the value of a , b, c and d as 1, 2, 3, 4 (a=1, b=2, c=3, and d=4), by solving we get the answer as (c+d) / (a+b).

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12. Eesha bought 18 sharpeners for Rs.100. She paid 1 rupee more for each white sharpener than for each brown sharpener. What is the price of a white sharpener and how many white sharpeners did she buy?

a. Rs. 5, 10

b. Rs. 6, 8

c. Rs. 6, 10

d. Rs. 5, 8

Ans: c

Explanation:

Let's solve from the options, if she bought 10 white sharpeners at Rs.6 per piece, She has spent Rs.60 already. And with the remaining Rs.40, she bought 8 brown sharpeners at 40/8 = Rs.5 which is Rs.1 less than the White sharpener. Hence Rs. 6 and 10 white sharpeners.

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13. The sum of the digits of a three digit number is 17, and the sum of the squares of its digits is 109. If we subtract 495 from the number, we shall get a number consisting of the same digits written in the reverse order. Find the number.

a. 683

b. 863

c. 944

d. 773

Ans: b

Explanation:

Let's solve from the options, Sum of the squares should be equal to 109. Only Options a and b satisfying. When we subtract 495, only 863 becomes 368.

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14. Raj goes to the market to buy oranges. If he can bargain and reduce the price per orange by Rs.2, he can buy 30 oranges instead of 20 oranges with the money he has. How much money does he have?

a. Rs. 50

b. Rs. 150

c. Rs. 120

d. Rs. 100

Ans: d

Explanation:

Let the money with Raj is M. So (M/20) - (M/30) = 2. Check options. Option c satisfies.

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15. A city in the US has a basketball league with three basketball teams, the Aziecs, the Braves and the Celtics. A sportswriter notices that the tallest player of the Aziecs is shorter than the shortest player of the Braves. The shortest of the Celtics is shorter than the shortest of the Aziecs, while the tallest of the Braves is shorter than the tallest of the Celtics. The tallest of the Braves is taller than the tallest of the Aziecs.

Which of the following can be judged with certainty?

X) Paul, a Brave is taller than David, an Aziec

Y) David, a Celtic, is shorter than Edward, an Aziec

a. Both X and Y

b. X only

c. Y only

d. Neither X nor Y

Ans: B

Explanation:

By assuming the values, let's solve it. Be the shortest of Braves is 4 feet, then tallest of Aziecs is less than 4. So let it be 3 feet.A -> 2 - 3,B -> 4 - 6,C -> 1 - 7.From the above, we can safely conclude X is correct. but Y cannot be determined.

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16. A BBCCC DDDD EEEEE..... What is the 120th letter?

a.L

b. O

c. K

d. N

Ans: b

Explanation:

Number of letters in each term are in AP. 1, 2, 3, ...So, n(n+1)/2 <= 120.For n = 15, we get LHS = 120. So 15th letter in the alphabet is O. So 15th term contains 15 Os.

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17. There are 120 male and 100 female in society. Out of 25% male and 20% female are rural. 20% of male and 25% of female rural people passed in the exam. What % of rural students have passed the exam?

a. 20%

b. 18%

c. 22%

d. 15%

Ans: c

Explanation:

From the given information, Rural male = 25%(120) = 30, Rural female = 20%(100) = 20.Passed students from rural: male = 20%(30) = 6, female = 25%(20) = 5.Required percentage = 11/50 * 100 = 22%.

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18. On the fabled Island of Knights and Knaves, we meet three people, A, B, and C, one of whom is a knight, one a knave, and one a spy. The knight always tells the truth, the knave always lies, and the spy can either lie or tell the truth. A says: "C is a knave."B says: "A is a knight."C says: "I am the spy."Who is the knight, who the knave, and who the spy?

a. A - Knight, B - Knave, C - Spy

b.A - Spy, B - Knight, C - Knave

c.A - Knave, B - Spy, C - Knight

d.A - Knight, B - Spy, C - Knave

Ans: d

Explanation:

Let us say A is Knight and speaks the truth.So Cis Knave and B is a spy. So Cs statement is false and Bs statement is true. This case is possible. IfB is Knight, this is not possible as A also becomes Knight as B speaks the truth.

Suppose C is Knight, this is clearly contradicted by C's statement itself.

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19. The average temperature of Tuesday, Wednesday and Thursday is 37 C. The average temperature of Wednesday, Thursday and Friday is 38 C. If the temperature on Friday is 39 C. Find the temperature on Tuesday.

a. 37.33

b. 38.33

c. 36

d. None of the above

Ans: c

Explanation:

The average temperature of Tuesday, Wednesday and Thursday is (Tue + Wed + Thu) / 3 = 37

Tue + Wed + Thu = 111 ------ (A)

The average temperature of Wednesday, Thursday and Friday is (Wed + Thu + Fri) / 3 = 38

Wed + Thu + Fri= 114 ------- (B)

Given Friday's temperature as 39, then (B) - (A) --> Fri - Tue = 3.So 39 - Tue = 3 --> Tue = 36.

Hence, the temperature on Tuesday is 36

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20. In a certain city, 60% of the registered voters are Congress supporters and the rest are BJP supporters. In an assembly election, if 75% of the registered congress supporters and 20% of the registered BJP supporters are expected to vote for candidate A, what percent of the registered voters are expected to vote for candidate A?

a. 20

b. 23

c. 50

d. 53

Ans: d

Explanation:

Let the people in the city be 100,Congress supporters = 60% of 100 = 60 and 40% are BJP=40% of 100 = 40.

Out of 60, 75% voted for congress=75%(60)=45

Out of 40%,20% voted for congress=20%(40)=8

In total = 45 + 8 = 53, Hence the total percentage of registered candidates - 53%

TCS Ninja advanced aptitude questions

1) How many pairs (m,n) of integers satisfy the equation 4^m = n^2 + 15? Please do not add white space around the answer _____

Answer: 4

2) Of all the nonempty subsets S of { 1, 2, 3, 4, 5, 6, 7}, how many do not contain the number |S|, where |S| denotes the number of elements in S? For example, {3, 4} is one such subset, since it does not contain the number 2. Please do not add white space around the answer _____

Answer: 63

3)A chord of a circle has length 3n, where n is a positive integer. The segment cut off by the chord has height n, as shown. What is the smallest value of n for which the radius of the circle is also a positive integer? Please do not add white space around the answer _____

Answer: 8

4) In how many ways can we give change for Rs.100 using 1 rupee and 2 rupee coins? For example, for 5 rs we can give three ways.

Answer:51

Explanation: The straightforward method to solve this question is to create 3 scenarios for Rs 100.

1) Only 1 rupee coins - There's 1 way in which we can do this.

2) Only 2 rupee coins - There's 1 way in which we can do this.

3) Combination of 1 and 2 rupee coins - In a combination, we can have from one 2 rupee coin (and 98 one rupee coins) to 49 two rupee coins (and 2 1 rupee coins). This gives us 49 ways.

Total number of ways = 51.

5) Find the number of positive integers N<2000 which can be expressed as N=2^m+2^n where m and n are integers (for example, 33=2^0+2^5).

a) 25

b) 65

c) 100

d) 150

Answer:b

Explanation: We know that 2^10 = 1024 < 2000 < 2048 = 2^11

Since 2^10+2^9 = 1536 < 2000, any combination of 2^m + 2^n < 2000 (as long as both m or n are not 10)

So, we would have the following possibilities;

2^10 + 2^n, (n = 1,2.9)

2^9 + 2^n, (n = 1,2.8)

And so on;

Therefore, the answer is (10*11)/2 = 65.

6) Fishing is a serious environmental issue. It has been determined by the scientists that if the net of a trawler has mesh size x cm by x (square mesh) then the percentage of fish entering the net that is caught in the net is 100-0.02x^2-0.05x. For example, if the mesh size is zero, 100% of the fish that enter the net will be caught. The trawler with a square mesh that was suspected of using an illegal size net, dropped its net to the ocean floor near the damans and coast guard officials arrested the crew. The scientists later looked at the size of the fish caught and estimated that the net used by the trawler at least caught 97.93% of the fish entering the net. What is the maximum value of x for the net by the trawler?

a) 8.5

b) 9

c) 11

d) 12

Answer:b

Explanation: