There is a 50m long army platoon marching ahead. The last person in the platoon wants to give a letter to the first person leading the platoon. So while the platoon is marching he runs ahead, reaches the first person and hands over the letter to him and without stopping he runs and comes back to his original position. In the mean time the whole platoon has moved ahead by 50m. The question is how much distance did the last person cover in that time. Assuming that he ran the whole distance with uniform speed.

Answer

The last person covered 120.71 meters.

It is given that the platoon and the last person moved with uniform speed. Also, they both moved for the identical amount of time. Hence, the ratio of the distance they covered - while person moving forward and backword - are equal.

Let's assume that when the last person reached the first person, the platoon moved X meters forward.

Thus, while moving forward the last person moved (50+X) meters whereas the platoon moved X meters.

Similarly, while moving back the last person moved [50-(50-X)] X meters whereas the platoon moved (50-X) meters.

Now, as the ratios are equal,

(50+X)/X = X/(50-X)

(50+X)*(50-X) = X*X

Solving, X=35.355 meters

Thus, total distance covered by the last person

= (50+X) + X

= 2*X + 50

= 2*(35.355) + 50

= 120.71 meters

Note that at first glance, one might think that the total distance covered by the last person is 100 meters, as he ran the total lenght of the platoon (50 meters) twice. TRUE, but that's the relative distance covered by the last person i.e. assuming that the platoon is stationary.

****

A contractor had employed 100 labourers for a flyover construction task. He did not allow any woman to work without her husband. Also, atleast half the men working came

with their wives. He paid five rupees per day to each man, four ruppes to each woman and one rupee to each child. He gave out 200 rupees every evening. How many men, women and children were working with the constructor?

Answer

16 men, 12 women and 72 children were working with the constructor.

Let's assume that there were X men, Y women and Z children working with the constructor. Hence,

$X + Y + Z = 100$

$5X + 4Y + Z = 200$

Eliminating X and Y in turn from these equations, we get

$X = 3Z - 200$

$Y = 300 - 4Z$

As if woman works, her husband also works and atleast half the men working came with their wives; the value of Y lies between X and X/2. Substituting these limiting values in equations, we get

if $Y = X$,

$300 - 4Z = 3Z - 200$

$7Z = 500$

$Z = 500/7$ i.e. 71.428

if $Y = X/2$,

$300 - 4Z = (3Z - 200)/2$

$600 - 8Z = 3Z - 200$

$11Z = 800$

$Z = 800/11$ i.e. 72.727

But Z must be an integer, hence Z=72. Also, X=16 and Y=12

There were 16 men, 12 women and 72 children working with the constructor.

****

Four friends - Arjan, Bhuvan, Guran and Lakha were comparing the number of sheep that they owned. It was found that Guran had ten more sheep than Lakha. If Arjan gave one-third to Bhuvan, and Bhuvan gave a quarter of what he then held to Guran, who then passed on a fifth of his holding to Lakha, they would all have an equal number of

sheep.How many sheep did each of them possess? Give the minimal possible answer.

Answer

Arjan, Bhuvan, Guran and Lakha had 90, 50, 55 and 45 sheep respectively.

Assume that Arjan, Bhuvan, Guran and Lakha had A, B, G and L sheep respectively. As it is given that at the end each would have an equal number of sheep, comparing the final numbers from the above table.

Arjan's sheep = Bhuvan's sheep

$2A/3 = A/4 + 3B/4$

$8A = 3A + 9B$

$5A = 9B$

Arjan's sheep = Guran's sheep

$2A/3 = A/15 + B/5 + 4G/5$

$2A/3 = A/15 + A/9 + 4G/5$ (as $B=5A/9$)

$30A = 3A + 5A + 36G$

$22A = 36G$

$11A = 18G$

Arjan's sheep = Lakha's sheep

$2A/3 = A/60 + B/20 + G/5 + L$

$2A/3 = A/60 + A/36 + 11A/90 + L$ (as $B=5A/9$ and $G=11A/18$)

$2A/3 = A/6 + L$

$A/2 = L$

$A = 2L$

Also, it is given that Guran had ten more sheep than Lakha.

$G = L + 10$

$11A/18 = A/2 + 10$

$A/9 = 10$

A = 90 sheep

Thus, Arjan had 90 sheep, Bhuvan had 5A/9 i.e. 50 sheep, Guran had 11A/18 i.e. 55

sheep and Lakha had A/2 i.e. 45 sheep.

****

You are locked inside a room with 6 doors - A, B, C, D, E, F. Out of which 3 are Entrances only and 3 are Exits only.

One person came in through door F and two minutes later second person came in through door A. He said, "You will be set free, if you pass through all 6 doors, each door once only and in correct order. Also, door A must be followed by door B or E, door B by C or E, door C by D or F, door D by A or F, door E by B or D and door F by C or D."

After saying that they both left through door B and unlocked all doors. In which order must you pass through the doors?

Answer

The correct order is CFDABE

It is given that one person came in through door F and second person came in through door A. It means that door A and door F are Entrances. Also, they both left through door B. Hence, door B is Exit.

As Exit and Entrance should alter each other and we know two Entrances, let's assume that the third Entrance is W. Thus, there are 6 possibilities with "_" indicating Exit.

(1) _W_A_F (2) _W_F_A (3) _F_W_A (4) _F_A_W (5) _A_W_F (6) _A_F_W

As door A must be followed by door B or E and none of them lead to the door F, (1) and (6) are not possible.

Also, door D must be the Exit as only door D leads to the door A and door A is the Entrance.

(2) _W_FDA (3) _F_WDA (4) _FDA_W (5) DA_W_F

Only door D and door C lead to the door F. But door D is used. Hence, door C must be the Exit and precede door F. Also, the third Exit is B and the W must be door E.

(2) BECFDA (3) CFBEDA (4) CFDABE (5) DACEBF

But only door B leads to the door C and both are Exits. Hence, (2) and (5) are not possible. Also, door F does not lead to door B - discard (3). Hence, the possible order is (4) i.e. CFDABE.

****

There is a safe with a 5 digit number as the key. The 4th digit is 4 greater than the second digit, while the 3rd digit is 3 less than the 2nd digit. The 1st digit is thrice the last digit. There are 3 pairs whose sum is 11.

Find the number.

Answer

65292

As per given conditions, there are three possible combinations for 2nd, 3rd and 4th digits. They are (3, 0, 7) or (4, 1, 8) or (5, 2, 9)

It is given that there are 3 pairs whose sum is 11. All possible pairs are (2, 9), (3, 8), (4, 7), (5, 6). Now required number is 5 digit number and it contains 3 pairs of 11. So it must not be having 0 and 1 in it. Hence, the only possible combination for 2nd, 3rd and 4th digits is (5, 2, 9)

Also, 1st digit is thrice the last digit. The possible combinations are (3, 1), (6, 2) and (9, 3), out of which only (6, 2) with (5, 2, 9) gives 3 pairs of 11. Hence, the answer is 65292.

****

A person travels on a cycle from home to church on a straight road with wind against him. He took 4 hours to reach there.

On the way back to the home, he took 3 hours to reach as wind was in the same direction. If there is no wind, how much time does he take to travel from home to church?

Answer

Let distance between home and church is D.

A person took 4 hours to reach church. So speed while travelling towards church is D/4.

Similarly, he took 3 hours to reach home. So speed while coming back is D/3.

There is a speed difference of 7*D/12, which is the wind helping person in 1 direction, & slowing him in the other direction. Average the 2 speeds, & you have the speed that person can travel in no wind, which is 7*D/24.

Hence, person will take D / (7*D/24) hours to travel distance D which is 24/7 hours.

Answer is 3 hours 25 minutes 42 seconds

****

If a bear eats 65 pounds in fish every day EXCEPT every 6th day which it only eats 45 pounds of fish. If the bear continues this, how many pounds of fish will it eat in 200 days?

Answer

The bear will eat 12,340 pounds of fish in 200 days.

It is given that on every 6th day beareats 45 pounds of fish i.e. on day number 6, 12, 18,

24, ... 192, 198 the bear eats 45 pounds of fish.

Total number of 6th days = 200/6 = 33 (the bear eats 45 pounds)

Hence, the normal days are = 200 - 33 = 167 (the bear eats 65 pounds)

Thus, in 200 days, the bear will eat

= (167) * (65) + (33) * (45)

= 10855 + 1485

= 12,340 pounds

****

Ankit and Tejas divided a bag of Apples between them.

Tejas said, "It's not fair! You have 3 times as many Apples I have." Ankit said, "OK, I will give you one Apple for each year of your age." Tejas replied, "Still not fair. Now, you have twice as many Apples as I have." "Dear, that's fair enough as I am twice older than you.", said Ankit.

Ankit went to Kitchen to drink water. While Ankit was in Kitchen, Tejas took apples from Ankit's pile equal to Ankit's age.

Who have more apples now?

Answer

At the end, Ankit and Tejas, both have the same number of apples.

Let's assume that initially Tejas got N apples and his age is T years. Hence, initially Ankit got 3N apples and his age is 2T years.

Operation Ankit's Apples Tejas's Apples

Initially 3N N

Ankit gave T apples to Tejas

(equals age of Tejas) 3N - T N + T

Tejas took 2T apples from Ankit's pile

(equals age of Ankit) 3N - 3T N + 3T

It is given that after Ankit gave T apples to Tejas, Ankit had twice as many apples as Tejas had.

3N - T = 2*(N + T)

3N - T = 2N + 2T

N = 3T

From the table, at the end Ankit have (3N - 3T) apples and Tejas have (N + 3T) apples. Substituting N = 3T, we get

Ankit's apples = 3N - 3T = 9T - 3T = 6T

Tejas's apples = N + 3T = 3T + 3T = 6T

Thus, at the end Ankit and Tejas, both have the same number of apples.

****

The sum of their (father, mother and son) ages is 70. The father is 6 times as old as the son. When the sum of their ages is twice 70, the father will be twice as old as the son. How old is the mother?

Answer

The mother is 29 years and 2 months old.

Let's assume that son is X years old. Hence, father is 6X years old and mother is (70-7X) years old.

It is given that the sum of their ages is 70, which will total 140 after 70/3 years.

After 70/3 years, son will be (X + 70/3) years old and father will be (6X + 70/3) years old. Also, it is given that after 70/3 years, the father will be twice as old as the son. Thus,

(6X + 70/3) = 2 * (X + 70/3)

6X + 70/3 = 2X + 140/3

4X = 70/3

X = 35/6

Hence, their ages are

Son = X = 35/6 = 5 years and 10 months

Father = 6X = 6(35/6) = 35 years

Mother = (70 - 7X) = 70 - 7(35/6) = 29 years and 2 months

****

Assume for a moment that the earth is a perfectly uniform sphere of radius 6400 km. Suppose a thread equal to the length of the circumference of the earth was placed along the equator, and drawn to a tight fit.

Now suppose that the length of the thread is increased by 12 cm, and that it is pulled away uniformly in all directions.

By how many cm. will the thread be separated from the earth's surface?

Answer

The cicumference of the earth is

= 2 * PI * r

= 2 * PI * 6400 km

= 2 * PI * 6400 * 1000 m

= 2 * PI * 6400 * 1000 * 100 cm

= 1280000000 * PI cm

where r = radius of the earth, PI = 3.141592654

Hence, the length of the thread is = 1280000000 * PI cm

Now length of the thread is increasd by 12 cm. So the new length is = (1280000000 * PI) + 12 cm

This thread will make one concentric circle with the earth which is slightly away from the earth. The circumfernce of that circle is nothing but (1280000000 * PI) + 12 cm

Assume that radius of the outer circle is R cm

Therefore,

2 * PI * R = (1280000000 * PI) + 12 cm

Solving above equation, R = 640000001.908 cm

Radius of the earth is r = 640000000 cm

Hence, the thread will be separatedfrom the earth by

= R - r cm

= 640000001.908 - 640000000

= 1.908 cm

Substitute digits for the letters to make the following relation true.

S T I L L

+ W I T H I N

L I M I T S

Note that the leftmost letter can't be zero in any word. Also, there must be a one-to-one mapping between digits and letters. e.g. if you substitute 3 for the letter S, no other letter can be 3 and all other S in the puzzle must be 3.

Answer

The value of L must be one more than W i.e. L=W+1 and there must be one carry from S+I=I. Also, the value of S must be 9 as S+I=I with one carry from T+T=M, which means that the value of T must be greater than 4.

From I+H=I, the value of H must be 0 as the value of S is 9.

Now, applying all those constraints and using trial-n-error, we get two possible answers.

9 7 1 6 6 9 8 5 3 3

+ 5 1 7 0 1 3 + 2 5 8 0 5 6

---------- ----------

6 1 4 1 7 9 3 5 6 5 8 9

****

Substitute digits for the letters to make the following Division true

O U T

S T E M | D E M I S E

| D M O C

T U I S

S T E M

Z Z Z E

Z U M M

I S T

Note that the leftmost letter can't be zero in any word. Also, there must be a one-to-one mapping between digits and letters. e.g. if you substitute 3 for the letter M, no other letter can be 3 and all other M in the puzzle must be 3.

Answer

C=0, U=1, S=2, T=3, O=4, M=5, I=6, Z=7, E=8, D=9

It is obvious that U=1 (as U*STEM=STEM) and C=0 (as I-C=I).

S*O is a single digit and also S*T is a single digit. Hence, their values (O, S, T) must be 2, 3 or 4 (as they can not be 0 or 1 or greater than 4).

Consider, STEM*O=DMOC, where C=0. It means that M must be 5. Now, its simple. O=4, S=2, T=3, E=8, Z=7, I=6 and D=9.

O U T 4 1 3

---------- ----------

S T E M | D E M I S E 2 3 8 5 | 9 8 5 6 2 8

| D M O C | 9 5 4 0

---------- ----------

T U I S 3 1 6 2

S T E M 2 3 8 5

---------- ----------

Z Z Z E 7 7 7 8

Z U M M 7 1 5 5

-------- --------

I S T 6 2 3

Also, when arranged from 0 to 9, it spells CUSTOMIZED.

****

If you look at a clock and the time is 3:15.

What is the angle between the hour and the minute hands? (The answer to this is not zero!)

Answer

7.5 degrees

At 3:15 minute hand will be perfactly horizontal pointing towards 3. Whereas hour hand will be towards 4. Also, hour hand must have covered 1/4 of angle between 3 and 4.

The angle between two adjacent digits is 360/12 = 30 degrees.

Hence 1/4 of it is 7.5 degrees.

****

A series comprising of alphabets contains 13 letters. The first seven letters in the given series are A, E, F, H, I, L, M

Can you find the next two letters?

Answer

The next letters in the series are N, O, R, S, U, X.

The pattern is - letters whose English names (Phonetic Pronunciations) start with vowels.

****

Which number in the series does not fit in the given series:

1 4 3 16 6 36 7 64 9 100

Answer

This is a series with odd positions containing position number whereas even positions containing square of the position.i.e. even position numbers are 4 16 36 64 100 and odd position numbers are 1 3 5 7 9

Hence, 6 does not fit in the series. It should be 5.

****

What are the next three numbers in the given series?

1 1 2 1 2 2 3 1 2 2 3 2 3 3 4 1 2 2 3 2 3 3 4 2 3 3 ?

Answer

The next three numbers in the series are 4, 3, 4.

The pattern is - the number of 1's in the binary expansion of the positive integers starting from 1.

Number Binary Equivalent # of 1's

1 1 1

2 10 1

3 11 2

4 100 1

5 101 2

6 110 2

7 111 3

8 1000 1

9 1001 2

10 1010 2

11 1011 3

12 1100 2

13 1101 3

14 1110 3

15 1111 4

16 10000 1

17 10001 2

18 10010 2

19 10011 3

20 10100 2

21 10101 3

22 10110 3

23 10111 4

24 11000 2

25 11001 3

26 11010 3

27 11011 4

28 11100 3

29 11101 4

The other way of looking at it is - break up the series into lines as follow:

1

1 2

1 2 2 3

1 2 2 3 2 3 3 4

1 2 2 3 2 3 3 4 2 3 3 4 3 4 4 5

A new line can be created by writing previous line followed by the previous line with 1 added to each number.

****

A cricket team of 11 players lined up in a straight line to have their photograph. The captain was asked to stand in the center of the line-up.

1) Bharat and Bhavin stood to the right of the captain

2) Two players stood between Bhagat and Bhairav

3) Seven players stood between Bhadrik and Bhanu

4) Bhavesh stood to the right of Bhuvan

5) Bhola and Bhumit stood either side of Bhagat

6) Bhavik and Bhumit stood to the left of the captain

7) Six players stood between Bhavin and Bhagat

8) Two players stood between Bhagat and Bhavik

Who is the captain? Can you tell the positions of all the palyers?

Answer

Players from left to right : Bhavik, (Bhadrik/Bhanu), (Bhola/Bhumit), Bhagat, (Bhola/Bhumit), BHUVAN, Bhairav, (Bharat/Bhavesh), (Bharat/Bhavesh), (Bhadrik/Bhanu), Bhavin

Let's number the positions 1 to 11 from left to right. Hence, the captain is at position 6. Now, looking at the clues 7, 5, 2 and 8 together:

Poistion 1 - Bhavik or Bhairav

Position 3 - Bhumit or Bhola

Position 4 - Bhagat

Position 5 - Bhumit or Bhola

Poistion 7 - Bhavik or Bhairav

Position 11 - Bhavin

From clue (3), the only possible positions for Bhadrik and Bhanu are Position 2 and Position 10.

Now there are 3 positions remaining - 6, 8 and 9 and remaining 3 players are Bhuvan, Bharat and Bhavesh. But from clue (1), Bharat stood to the right of the captain i.e. Bharat must be on position 8 or 9 as position 6 is for the captain. So either Bhuvan or Bhavesh is the captain.

From (4), Bhavesh stood to the right of Bhuvan. Hence, Bhuvan is the captain.

Players from left to right are : Bhavik, (Bhadrik/Bhanu), (Bhola/Bhumit), Bhagat, (Bhola/Bhumit), BHUVAN, Bhairav, (Bharat/Bhavesh), (Bharat/Bhavesh), (Bhadrik/Bhanu), Bhavin.

Thus,

* Bhavik(1), Bhagat(4), Bhuvan(6), Bhairav(7) and Bhavin(11) are the players whose positions are fixed.

* Bhadrik and Bhanu are at position 2 or 10.

* Bhola and Bhumit are at position 3 or 5.

* Bharat and Bhavesh are at position 8 or 9.

****

In the middle of the confounded desert, there is the lost city of "Ash". To reach it, I will have to travel overland by foot from the coast. On a trek like this, each person can only carry enough rations for five days and the farthest we can travel in one day is 30 miles. Also, the city is 120 miles from the starting point.

What I am trying to figure out is the fewest number of persons, including myself, that I will need in our Group so that I can reach the city, stay overnight, and then return to the coast without running out of supplies.

How many persons (including myself) will I need to accomplish this mission?

Answer

Total 4 persons (including you) required.

It is given that each person can only carry enough rations for five days. And there are 4 persons. Hence, total of 20 days rations is available.

1. First Day : 4 days of rations are used up. One person goes back using one day of rations for the return trip. The rations remaining for the further trek is for 15 days.

2. Second Day : The remaining three people use up 3 days of rations. One person goes back using 2 days of rations for the return trip. The rations remaining for the further trek is for 10 days.

3. Third Day : The remaining two people use up 2 days of rations. One person goes back using 3 days of rations for the return trip. The rations remaining for the further trek is for 5 days.

4. Fourth Day : The remaining person uses up one day of rations. He stays overnight. The next day he returns to the coast using 4 days of rations.

Thus, total 4 persons, including you are required.

****

There are 10 statements written on a piece of paper:

1. At least one of statements 9 and 10 is true.

2. This either is the first true or the first false statement.

3. There are three consecutive statements, which are false.

4. The difference between the numbers of the last true and the first true statement divides the number, that is to be found.

5. The sum of the numbers of the true statements is the number, that is to be found.

6. This is not the last true statement.

7. The number of each true statement divides the number, that is to be found.

8. The number that is to be found is the percentage of true statements.

9. The number of divisors of the number, that is to be found, (apart from 1 and itself) is greater than the sum of the numbers of the true statements.

10. There are no three consecutive true statements.

Find the minimal possible number?

Answer

The numebr is 420.

If statement 6 is false, it creates a paradox. Hence, Statement 6 must be true.

Consider Statement 2:

* If it is true, it must be the first true statement. Otherwise, it creates a paradox.

* If it is false, it must be the second false statement. Otherwise, it creates a paradox.

In both the cases, Statement 1 is false.

As Statement 1 is false, Statement 9 and Statement 10 both are false i.e. there are three consecutive true statements.

1 2 3 4 5 6 7 8 9 10

False - - - - True - - False False

Let\'s assume that Statement 3 is false i.e. there are no three consecutive false statements. It means that Statement 2 and Statement 8 must be true, else there will be three consecutive false statements.

1 2 3 4 5 6 7 8 9 10

False True False - - True - True False False

Also, atleast two of Statements 4, 5 and 7 must be true as there are three consecutive true statements.

According to Statement 8, the number that is to be found is the percentage of true statements. Hence, number is either 50 or 60. Now if Statement 7 is true, then the number of each true statement divides the number, that is to be found. But 7 and 8 do not divide either 50 or 60. Hence, Statement 7 is false which means that Statement 4 and 5 are true. But Statement 5 contradicts the Statement 8. Hence, our assumption that Statement 3 is false is wrong and Statement 3 is true i.e. there are 3 consecutive false statements which means that Statement 8 is false as there is no other possibilities of 3 consecutive false statements.

Also, Statement 7 is true as Statement 6 is not the last true statement.

1 2 3 4 5 6 7 8 9 10

False - True - - True True False False False

According to Statement 7, the number of each true statement divides the number, that is to be found. And according to Statement 5, the sum of the numbers of the true statements is the number, that is to be found. For all possible combinations Statement 5 is false.

There 3 consecutive true statements. Hence, Statement 2 and Statement 4 are true.

1 2 3 4 5 6 7 8 9 10

False True True True False True True False False False

Now, the conditions for the number to be found are:

1. The numebr is divisible by 5 (Statement 4)

2. The numebr is divisible by 2, 3, 4, 6, 7 (Statement 7)

3. The number of divisors of the number, that is to be found, (apart from 1 and itself) is not greater than the sum of the numbers of the true statements. (Statement 9)

The minimum possible number is 420.

The divisors of 420, apart from 1 and itself are 2, 3, 4, 5, 6, 7, 10, 12, 14, 15, 20, 21, 28,

30, 35, 42, 60, 70, 84, 105, 140, 210. There are total of 22 divisors. Also, the sum of the numbers of the true statements is 22 (2+3+4+6+7=22), which satisfies the third condition.

****

500 men are arranged in an array of 10 rows and 50 columns according to their heights.

Tallest among each row of all are asked to come out. And the shortest among them is A.

Similarly after resuming them to their original positions, the shortest among each column are asked to come out. And the tallest among them is B.

Now who is taller A or B ?

Answer

No one is taller, both are same as A and B are the same person.

As it is mentioned that 500 men are arranged in an array of 10 rows and 50 columns according to their heights. Let's assume that position numbers represent their heights. Hence, the shortest among the 50, 100, 150, ... 450, 500 is person with height 50 i.e. A. Similarly the tallest among 1, 2, 3, 4, 5, ... 48, 48, 50 is person with height 50 i.e. B

Now, both A and B are the person with height 50. Hence both are same.

****

A rich man died. In his will, he has divided his gold coins among his 5 sons, 5 daughters and a manager.

According to his will: First give one coin to manager. 1/5th of the remaining to the elder son. Now give one coin to the manager and 1/5th of the remaining to second son and so on..... After giving coins to 5th son, divided the remaining coins among five daughters equally.

All should get full coins. Find the minimum number of coins he has?

Answer

We tried to find out some simple mathematical method and finally we wrote small C program to find out the answer. The answer is 3121 coins.

Here is the breakup:

First son = 624 coins

Second son = 499 coins

Third son = 399 coins

Forth son = 319 coins

Fifth son = 255 coins

Daughters = 204 each

A stick of length 1 is divided randomly into 3 parts.

What is the probability that a triangle can be made with those three parts?

Answer

The probability, that a triangle can be made by randomly dividing a stick of length 1 into 3 parts, is 25%

A triangle can be made, if and only if, sum of two sides is greater than the third side. Thus,

X1 < X2 + X3

X2 < X3 + X1

X3 < X1 + X2

Also, it is given that X1 + X2 + X3 = 1

From above equations: X1 < 1/2, X2 < 1/2, X3 < 1/2

Thus, a triangle can be formed, if all three sides are less than 1/2 and sum is 1.

Now, let's find the probability that one of X1, X2, X3 is greater than or equal to 1/2.

Note that to divide stick randomly into 3 parts, we need to choose two numbers P and Q, both are between 0 & 1 and P

Now, X1 will be greater than or equal to 1/2, if and only if both the numbers, P & Q, are greater than or equal to 1/2. Thus, probability of X1 being greater than or equal to 1/2 is = (1/2) * (1/2) = 1/4

Similarly, X3 will be greater than or equal to 1/2, if and only if both the numbers, P & Q, are less than or equal to 1/2. Thus, probability of X3 being greater than or equal to 1/2 is = (1/2) * (1/2) = 1/4

Also, probability of X2 being greater than or equal to 1/2 is = (1/2) * (1/2) = 1/4

The probability that a triangle can not be made

= (1/4) + (1/4) + (1/4)

= (3/4)

Thus, the probability that a triangle can be made

= 1 - (3/4)

= (1/4)

= 25 %

Thus, the probability that a triangle can be made by randomly dividing a stick of length 1 into 3 parts is 25%

Let's generalise the problem. What is the probability that a polygon with (N+1) sides can be made from (N+1) segments obtained by randomly dividing a stick of length l into (N+1) parts?

The probability is = 1 - (N+1)*(1/2)^N

The probability tends to 1 as N grows. Thus, it is easier to make a N-sided polygon than it is to make a triangle!!!

****

There are 4 mathematicians - Brahma, Sachin, Prashant and Nakul - having lunch in a hotel. Suddenly, Brahma thinks of 2 integer numbers greater than 1 and says, "The sum of the numbers is..." and he whispers the sum to Sachin. Then he says, "The product of the numbers is..." and he whispers the product to Prashant. After that following conversation takes place :

Sachin : Prashant, I don't think that we know the numbers.

Prashant : Aha!, now I know the numbers.

Sachin : Oh, now I also know the numbers.

Nakul : Now, I also know the numbers.

What are the numbers? Explain your answer.

Answer

The numbers are 4 and 13.

As Sachin is initially confident that they (i.e. he and Prashant) don't know the numbers, we can conclude that -

1) The sum must not be expressible as sum of two primes, otherwise Sachin could not have been sure in advance that Prashant did not know the numbers.

2) The product cannot be less than 12, otherwise there would only be one choice and Prashant would have figured that out also.

Such possible sum are - 11, 17, 23, 27, 29, 35, 37, 41, 47, 51, 53, 57, 59, 65, 67, 71, 77, 79, 83, 87, 89, 93, 95, 97, 101, 107, 113, 117, 119, 121, 123, 125, 127, 131, 135, 137, 143, 145, 147, 149, 155, 157, 161, 163, 167, 171, 173, 177, 179, 185, 187, 189, 191, 197, ...

Let's examine them one by one.

If the sum of two numbers is 11, Sachin will think that the numbers would be (2,9), (3,8), (4,7) or (5,6).

Sachin : "As 11 is not expressible as sum of two primes, Prashant can't know the numbers."

Here, the product would be 18(2*9), 24(3*8), 28(4*7) or 30(5*6). In all the cases except for product 30, Prashant would know the numbers.

- if product of two numbers is 18:

Prashant : "Since the product is 18, the sum could be either 11(2,9) or 9(3,6). But if the sum was 9, Sachin would have deduced that I might know the numbers as (2,7) is the possible prime numbers pair. Hence, the numbers must be 2 and 9." (OR in otherwords, 9 is not in the Possible Sum List)

- if product of two numbers is 24:

Prashant : "Since the product is 24, the sum could be either 14(2,12), 11(3,8) or 10(4,6). But 14 and 10 are not in the Possible Sum List. Hence, the numbers must be 3 and 8."

- if product of two numbers is 28:

Prashant : "Since the product is 28, the sum could be either 16(2,14) or 11(4,7). But 16 is not in the Possible Sum List. Hence, the numbers must be 4 and 7."

- if product of two numbers is 30:

Prashant : "Since the product is 30, the sum could be either 17(2,15), 13(3,10) or 11(5,6). But 13 is not in the Possible Sum List. Hence, the numbers must be either (2,15) or (5,6)." Here, Prashant won't be sure of the numbers.

Hence, Prashant will be sure of the numbers if product is either 18, 24 or 28.

Sachin : "Since Prashant knows the numbers, they must be either (3,8), (4,7) or (5,6)." But he won't be sure. Hence, the sum is not 11.

Summerising data for sum 11:

Possible Sum PRODUCT Possible Sum

2+9 18 2+9=11 (possible)

3+6=9

3+8 24 2+12=14

3+8=11 (possible)

4+6=10

4+7 28 2+12=14

3+8=11 (possible)

4+6=10

5+6 30 2+15=17 (possible)

3+10=13

5+6=11 (possible)

Following the same procedure for 17:

Possible Sum PRODUCT Possible Sum

2+15 30 2+15=17 (possible)

3+10= 13

5+6=11 (possible)

3+14 42 2+21=23 (possible)

3+14=17 (possible)

6+7=13

4+13 52 2+26=28

4+13=17 (possible)

5+12 60 2+30=32

3+20=23 (possible)

4+15=19

5+12=17 (possible)

6+10=16

6+11 66 2+33=35 (possible)

3+22=25

6+11=17 (possible)

7+10 70 2+35=37 (possible)

5+14=19

7+10=17 (possible)

8+9 72 2+36=38

3+24=27 (possible)

4+18=22

6+12=18

8+9=17 (possible)

Here, Prashant will be sure of the numbers if the product is 52.

Sachin : "Since Prashant knows the numbers, they must be (4,13)."

For all other numbers in the Possible Sum List, Prashant might be sure of the numbers but Sachin won't.

Here is the step by step explaination:

Sachin : "As the sum is 17, two numbers can be either (2,15), (3,14), (4,13), (5,12), (6,11), (7,10) or (8,9). Also, as none of them is a prime numbers pair, Prashant won't be knowing numbers either."

Prashant : "Since Sachin is sure that both of us don't know the numbers, the sum must be one of the Possible Sum List. Further, as the product is 52, two numbers can be either (2,26) or (4,13). But if they were (2,26), Sachin would not have been sure in advance that I don't know the numbers as 28 (2+26) is not in the Possible Sum List. Hence, two numbers are 4 and 13."

Sachin : "As Prashant now knows both the numbers, out of all possible products - 30(2,15), 42(3,14), 52(4,13), 60(5,12), 66(6,11), 70(7,10), 72(8,9) - there is one product for which list of all possible sum contains ONLY ONE sum from the Possible Sum List. And also, no such two lists exist. [see table above for 17] Hence, two numbers are 4 and 13."

Nakul figured out both the numbers just as we did by observing the conversation between Sachin and Prashant.

It is interesting to note that there are no other such two numbers. We checked all the possible sums till 500 !!!

****

Ali Baba had four sons, to whom he bequeathed his 39 camels, with the proviso that the legacy be divided in the following way :

The oldest son was to receive one half the property, the next a quarter, the third an eighth and the youngest one tenth. The four brothers were at a loss as how to divide the inheritance among themselves without cutting up a camel, until a stranger appeared upon the scene.

Dismounting from his camel, he asked if he might help, for he knew just what to do. The brothers gratefully accepted his offer.

Adding his own camel to Ali Baba's 39, he divided the 40 as per the will. The oldest son received 20, the next 10, the third 5 and the youngest 4. One camel remained : this was his, which he mounted and rode away.

Scratching their heads in amazement, they started calculating. The oldest thought : is not 20 greater than the half of 39? Someone must have received less than his proper share ! But each brother discovered that he had received more than his due. How is it possible?

Answer

They took their percentages from 40 and not from 39, so they got more than their share.

The oldest son got 1/2 of 40 = 20 which is 0.5 more

The second son got 1/4 of 40 = 10 which is 0.25 more

The third son got 1/8 of 40 = 5 which is 0.125 more

The youngest son got 1/10 of 40 = 4 which is 0.1 more

And the stranger got 1/40 of 40 = 1 which is 0.025 more (As he is not supposed to get anything)

All these fractions add to = 0.5 + 0.25 + 0.125 + 0.1 + 0.025 = 1 which stranger took away.

****

The Bulls, Pacers, Lakers and Jazz ran for a contest.

Anup, Sujit, John made the following statements regarding results.

* Anup said either Bulls or Jazz will definitely win

* Sujit said he is confident that Bulls will not win

* John said he is confident that neither Jazz nor Lakers will win

When the result came, it was found that only one of the above three had made a correct statement. Who has made the correct statement and who has won the contest?

Answer

Sujith has made the correct statement and Lakers has won the contest.

Let's solve it. Create the table with the statements made.

Bulls Pacers Lakers Jazz

Anup YES YES

Sujit NO

John NO NO

Now let's analyse the situation by assuming that Anup has made the correct statement. It means that either Bulls or Jazz has won the contest.

* If bulls has won, then John is also correct

* If Jazz has won, then Sujit is also correct.

In either case Anup has made the wrong statement.

Now assume that Sujit has made the correct statement. It means that either or Pacers or Lakers or Jazz won the contest.

* If Pacers has won, then John is also correct.

* If Jazz has won, then Anup is also correct.

* If Lakers has won, then Anup and John both are wrong.

So is the answer - Sujit has made the correct statement and Lakers won the contest.

Similarly, analyse for john which means either Bulls or Pacershas won the contest.

****

What are the next three numbers in the given series?

1 2 3 2 1 2 3 4 2 1 2 3 4 3 2 ? ? ?

Answer

The next three numbers are 3, 4 and 5.

The pattern is - the number of letters in the Roman numeral representation of the numbers i.e. number of letters in I, II, III, IV, V, VI, VII, VIII, IX, X, XI, XII, XIII, XIV, XV, ...

Hence, the next numbers in the given series are 3(XVI), 4(XVII), 5(XVIII), 3(XIX), 2(XX), 3(XXI), 4(XXII), 5(XXIII), 4(XXIV), 3(XXV), etc...

****

Consider a state lottery where you get to choose 8 numbers from 1 to 80, no repetiton allowed. The Lottery Commission chooses 11 from those 80 numbers, again no repetition. You win the lottery if atleast 7 of your numbers are there in the 11 chosen by the Lottery Commission.

What is the probablity of winning the lottery?

Answer

The probability of winning the lottery is two in one billion i.e. only two person can win from one billion !!!

Let's find out sample space first. The Lottery Commission chooses 11 numbers from the 80. Hence, the 11 numbers from the 80 can be selected in 80C11 ways which is very very high and is equal to 1.04776 * 1013

Now, you have to select 8 numbers from 80 which can be selected in 80C8 ways. But we are interested in only those numbers which are in 11 numbers selected by the Lottery Commision. There are 2 cases.

* You might select 8 numbers which all are there in 11 numbers choosen by the Lottery Commission. So there are 11C8 ways.

* Another case is you might select 7 lucky numbers and 1 non-lucky number from the remaining 69 numbers. There are (11C7) * (69C1) ways to do that.

So total lucky ways are

= (11C8) + (11C7) * (69C1)

= (165) + (330) * (69)

= 165 + 22770

= 22935

Hence, the probability of the winning lottery is

= (Total lucky ways) / (Total Sample space)

= (22935) / (1.04776 * 1013)

= 2.1889 * 10-9

i.e. 2 in a billion.

****

Write 1111.....(243 times) i.e. a 243 digit number with all 1s.

Prove that it is divisible by 243.

Submitted by : Simat Goyal

Answer

Prove it using the mathematical induction.

First here are a couple of things to note:

[1] A number whose digits add up to a multiple of three is divisable by 3.

e.g. 369: 3+6+9=18: 1+8=9 which is a multiple of 3 hence 369 is divisable by 3.

[2] Whenever a number (X) is multiplied with another number (Y) then the product (X*Y) will have all the factors of X as well as all the factors of Y in its set of factors.

e.g. if X has factors of (1,P,Q,X) and Y has factors of (1,Q,R,Y) then X*Y has factors of (1,P,Q,Q,R,X,Y).

Let

N = any series of digits (e.g. N=369)

D = the number of digits in N (e.g. if N=369 then D=3)

P = is a number constructed in the following way : a 1, followed by (D-1) 0s, followed by another 1, followed by (D-1) 0s, followed by another 1. (e.g. if N=369 then D=3 and P would be 1001001) Note that P will always be divisible by 3.

Also, if we multiply N with P we are essentially repeating N for (D-1) times.

e.g. if N=369 then D=3, P=1001001 and N*P=369369369

Let's start with N=111. It is clear that N is divisible by 3. (From [1])

Also, D=3 and P=1001001

N*P=111111111 (9 times)

The resulting number 111111111 must be divisible by 9 as N and P both are divisible by 3.

Now, let's start with N=111111111. It is clear that N is divisible by 9.

Also, D=9 and P=1000000001000000001

N*P=111111111... (27 times)

The resulting number 1111111... (27 times) must be divisible by 27 as N is divisible by 9 and P is divisible by 3.

Repeat the same procedure for N=1111111... (27 times) The resulting number 1111111... (81 times) must be divisible by 81 as N is divisible by 27 and P is divisible by 3.

Similarly, for N=1111111... (81 times) The resulting number 1111111... (243 times) must be divisible by 243 as N is divisible by 81 and P is divisible by 3.

Thus, 1111111... (243 times) is divisible by 243.

****

What are the next two numbers in the series?

29, 11, 13, 17, 25, 32, 37, ?, ?

Answer

The next two numbers are 47 and 58.

The pattern is : Sum of the digits in all previous numbers in the squence.

First Number = 29

Second Number = 2 + 9 = 11

Third Number = (11) + 1 + 1 = 13

Forth Number = (13) + 1 + 3 = 17

Fifth Number = (17) + 1 + 7 = 25

Sixth Number = (25) + 2 + 5 = 32

Seventh Number = (32) + 3 + 2 = 37

Eight Number = (37) + 3 + 7 = 47

Ninth Number = (47) + 4 + 7 = 58

****

Substitute digits for the letters to make the following relation true.

S E N D

+ M O R E

M O N E Y

Note that the leftmost letter can't be zero in any word. Also, there must be a one-to-one mapping between digits and letters. e.g. if you substitute 3 for the letter S, no other letter can be 3 and all other S in the puzzle must be 3.

Submitted by : Omesh Garg

Answer

It is obvious that M=1.

If S=9 and if there is a carry, the maximum value of O will be 1. But M=1. Hence, O has to be 0.

Also, S has to be 9 as there is no other way of getting total 10 for S+M.

Now, N is (E+1) i.e. there must be a carry from (N+R). It means that R must be 9 which is already assigned to S. Hence, R has to be 8 and a carry from (D+E) will make R's value

9. Now,

Arrange five planets such that 4 of them add up to 5th planet numerically. Each of the letters of the planet should represent a unique number from the range 0 - 9. You have to use all ten digits.

There is an amazing mathematical relationship exists among the names of the planet.

Answer

The tought process is initially to find planets such that the total number of alphabets in them is 10.

The only possible combination of planets is Saturn, Uranus, Venus, Mars and Neptune because for other combinations there will be more than 10 alphabets. Among these five, Neptune is the lenghtiest, so it must be the sum of the other four.

S A T U R N

U R A N U S

V E N U S

+ M A R S

N E P T U N E

Now the only possible value for N is 1. By finding the value for S, we can reach the result:

3 5 8 6 9 1

6 9 5 1 6 3

2 0 1 6 3

+ 4 5 9 3

---

1 0 7 8 6 1 0

****

Ekta got chocolates to give her friends on her Birthday. If she gives 3 chocolates to each friend, one friend will get only 2 chocolates. Also, if she gives 2 chocolates to each friends, she will left with 15 chocolates.

How many chocolates Ekta got on her Birthday? and how many friends are there?

Answer

47 Chocolates and 16 Friends

Let's assume that there are total C chocolates and F friends.

According to first case, if she gives 3 chocolates to each friend, one friend will get only 2 chocolates.

3*(F - 1) + 2 = C

Similarly, if she gives 2 chocolates to each friends, she will left with 15 chocolates.

2*F + 15 = C

Solving above 2 equations, F = 16 and C = 47. Hence, Ekta got 47 chocolates and 16 friends.

****

Five executives of a Cultural Committee hold a conference in Mumbai.

Mr. A converses in English and Marathi.

Mr. B converses in Hindi and English.

Mr. C converses in Marathi and Hindi.

Mr. D converses in Hindi and Gujarati.

Mr. E, a native Marathi, can also converse in Gujarati.

If a sixth executive is brought in, to be understood by the maximum number of the original five, he should be fluent in which 2 languages?

Answer

The sixth person should be fluent in Hindi & Marathi.

Find out how many executives can understand each of the language.

Three executives speak Hindi - Mr. B, Mr. C and Mr. D. The other two executives - Mr. A and Mr. E, speak Marathi. Thus, the sixth executive should be fluent in Hindi and Marathi so that original five executives can converse with him.

****

If today is Wednesday, what is one day before the day, after the day, three days after the day before yesterday?

Answer

Thursday

Start backwards.

Today is Wednesday.

The day before yesterday is Monday.

Three days after Monday is Thursday.

The day after Thursday is Friday

The day before Friday is Thursday.

Also, note that the first two conditions cancel each other out as one day before the day, one day after the day is the same day. Hence, it can be reduced to "three days after the day before yesterday".

****

Ben can never tell a lie, George can never tell the truth.

One of them said, "The other one said he was George".

Who said that?

Answer

The speaker is George.

Since Ben cann't lie, he cann't say that he is George. Similarly, since George cann't tell the truth, he too cann't say that he is George. Thus, none of them can say that he is George. It means that the speaker is lying. Hence, the speaker must be George.

****

A girl has a certain number of pets. All but two are dogs, all but two are cats and all but two are goats. How many pets does this girl have?

Answer

The answer is 3 i.e. 1 dog, 1 cat and 1 goat

It says "all but two are dogs", which means that 2 are not dog. Similarly, 2 are not cat and 2 are not goat. Thus solution is there are 3 pets out of which one is dog, one is cat and one is goat.

Also, there is one more aspect to it. The girl might have only 2 pets and none of them is dog or cat or goat.

****

There is a family party consisting of two fathers, two mothers, two sons, one father-in-law, one mother-in-law, one daughter-in-law, one grandfather, one grandmother and one grandson.

What is the minimum number of persons required so that this is possible?

Answer

There are total 2 couples and a son. Grandfather and Grand mother, their son and his wife and again their son. So total 5 people.

Grandfather, Grandmother

|

|

Son, wife

|

|

Son

****

If a rook and a bishop of a standard chess set are randomly placed on a chessboard, what is the probability that one is attacking the other?

Note that both are different colored pieces.

Answer

The probability of either the Rook or the Bishop attacking the other is 0.3611

A Rook and a Bishop on a standard chess-board can be arranged in 64P2 = 64*63 = 4032 ways

Now, there are 2 cases - Rook attacking Bishop and Bishop attacking Rook. Note that the Rook and the Bishop never attack each other simultaneously. Let's consider both the cases one by one.

Case I - Rook attacking Bishop

The Rook can be placed in any of the given 64 positions and it always attacks 14 positions. Hence, total possible ways of the Rook attacking the Bishop = 64*14 = 896 ways

Case II - Bishop attacking Rook

View the chess-board as a 4 co-centric hollow squares with the outermost square with side 8 units and the innermost square with side 2 units.

If the bishop is in one of the outer 28 squares, then it can attack 7 positions. If the bishop is in one of the 20 squares at next inner-level, then it can attack 9 positions. Similarly if

the bishop is in one of the 12 squares at next inner-level, then it can attack 11 positions. And if the bishop is in one of the 4 squares at next inner-level (the innermost level), then it can attack 13 positions.

Hence, total possible ways of the Bishop attacking the Rook

= 28*7 + 20*9 + 12*11 + 4*13

= 560 ways

Thus, the required probability is

= (896 + 560) / 4032

= 13/36

= 0.3611

****

Substitute digits for the letters to make the following Division true.

A L E

C A R | E A R L Y

| C A R

R F F L

I L Y I

Y Y I Y

Y Y A U

T

Note that the leftmost letter can't be zero in any word. Also, there must be a one-to-one mapping between digits and letters. e.g. if you substitute 3 for the letter Y, no other letter can be 3 and all other Y in the puzzle must be 3.

Submitted by : Calon

Answer

A simple one !!!

* A=1, as A*CAR=CAR

* F=0, as A-A=F and R-R=F

* I=2, as YYIY-YYAU=T, hence I must be A+1

* R=3, as RFFL-ILYI=YYI, hence R must be I+1

* L=4, as RFFL-ILYI=YYI and I=2

* Y=5, as C13*4=24Y2

* C=6, as C13*4=2452

* E=9, as E-C=R

* U=7 and T=8

1 4 9

---

6 1 3 | 9 1 3 4 5

| 6 1 3

---

3 0 0 4

2 4 5 2

---

5 5 2 5

5 5 1 7

8

****

If A+B=C, D-C=A and E-B=C, then what does D+F stands for? Provide your answer in letter terms as well as in number terms.

Answer

J or 10

A simple one.

Assume that each character represents the number equivalent to the position in the alphabet i.e. A = 1, B = 2, C = 3, D = 4 and so on. Now let's check our assumption.

A + B = C i.e. 1 + 2 = 3

D - C = A i.e. 4 - 3 = 1

E - B = C i.e. 5 - 2 = 3

Thus, our assumption was Correct. Hence, D + F = J i.e. 4 + 6 = 10

****

Find the next two numbers in the given series.

0 2 3 4 5 5 7 6 6 7 11 7 13 9 8 8 17 8 19 9 10 13 23 ? ?

Answer

The next two numbers are 9 and 10.

The pattern is - sum of factors in prime factorization of positive integers starting with 1. Note that 1 is not a Prime number.

Integer Prime Factorization Sum

1 - 0

2 2 2

3 3 3

4 2*2 4

5 5 5

6 2*3 5

7 7 7

8 2*2*2 6

9 3*3 6

10 2*5 7

11 11 11

12 2*2*3 7

13 13 13

14 2*7 9

15 3*5 8

16 2*2*2*2 8

17 17 17

18 2*3*3 8

19 19 19

20 2*2*5 9

21 3*7 10

22 2*11 13

23 23 23

24 2*2*2*3 9

25 5*5 10

Hence, the next numbers in the series are 9 10 15 9 11 29 10 31 10 14 19 12 10 37 21 16 11 41 12 43 15 11 25 47 11 14 12 .....

****

In order to conduct the work at store it is necessary to have a minimum of three workers each day. The staff consists of five persons who work on part time basis. Alice can work on Mondays, Wednesdays and Fridays. Betty cannot report for work on Wednesdays. Carol can report for work on Tuesdays and Wednesdays only. Dorothy cannot work on Fridays. Emmy is available anytime except on the first Monday and Thursday of the month.

During which day of the week, might it be impossible to conduct the work at store? Note that the store remains close on Sundays.

Answer

It will be impossible to conduct the work on first thursday.

Summarizing the availability of staff day-wise.

Monday - Alice, Betty, Dorothy, Emmy (except first Monday)

Tuesday - Betty, Carol, Dorothy, Emmy

Wednesday - Alice, Carol, Dorothy, Emmy

Thursday - Betty, Dorothy, Emmy (except first Thursday)

Friday - Alice, Betty, Emmy

Saturday - Betty, Dorothy, Emmy

Betty and Dorothy are available on all Thursday. Emmy is also available on Thursdays, except first Thursday. Hence, on first Thursday it will be impossible to conduct the work.

****

In the General meeting of "Friends Club", Sameer said, "The repairs to the Club will come to a total of Rs 3120 and I propose that this amount should be met by the members, each paying an equal amount."

The proposal was immediately agreed. However, four members of the Club chose to resign, leaving the remaining members to pay an extra Rs 26 each.

How many members did the Club originally have?

Answer

The Club originally had 24 members.

Assume that there were initially N members.

As 4 members resigned and remaining members paid Rs 26 each, it means that total amount of 4 members is equal to Rs 26 each from remaining (N-4) members. Thus,

4 * (3120 / N) = 26 * (N - 4)

12480 = 26N2 - 104N

26N2 - 104N - 12480 = 0

Solving the quadratic equation we get N=24.

Hence, the Club originally had 24 members.

****

Find the smallest number such that if its rightmost digit is placed at its left end, the new number so formed is precisely 50% larger than the original number.

Answer

The answer is 285714.

If its rightmost digit is placed at its left end, then new number is 428571 which is 50% larger than the original number 285714.

The simplest way is to write a small program. And the other way is trial and error !!!

****

There are 10 boxes containing 10 balls each. 9 boxes contain 10 balls of 10 kg each and one box contains 10 balls of 9 kg each. Tool is available for proper weighing. How can

you find out the box containing 9 kg balls?

You are allowed to weigh only once. You can remove balls from the boxes. All balls are of same size and color.

Answer

1. Mark the boxes with numbers 1, 2, 3, 4, ... upto 10

2. Take 1 ball from box 1, take 2 balls from box 2, take 3 balls from box 3, take 4 balls from box 4 and so on

3. Put all of them on the scale at once and take the measurement.

4. Now, subtract the measurement from 550 (1*10 + 2*10 + 3*10 + 4*10 + 5*10 + 6*10 + 7*10 + 8*10 + 9*10 + 10*10)

5. The result will give you the box number which has a ball of 9 Kg

****

At University of Probability, there are 375 freshmen, 293 sophomores, 187 juniors, & 126 seniors. One student will randomly be chosen