PnC

Words

Answer the questions on the basis of the information given below. A string of three English letters is formed as per the following rules:
I. The first letter is any vowel.
II. The second letter is m, n or p.
III. If the second letter is m, then the third letter is any vowel which is different from the first letter.
IV. If the second letter is n, then the third letter is e or u.
V. If the second letter is p, then the third letter is the same as the first letter.

How many strings of letters can possibly be formed using the above rules?

1. 40 2. 45 3. 30 4. 35

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How many strings of letters can possibly be formed using the above rules such that the third letter of the string is e?

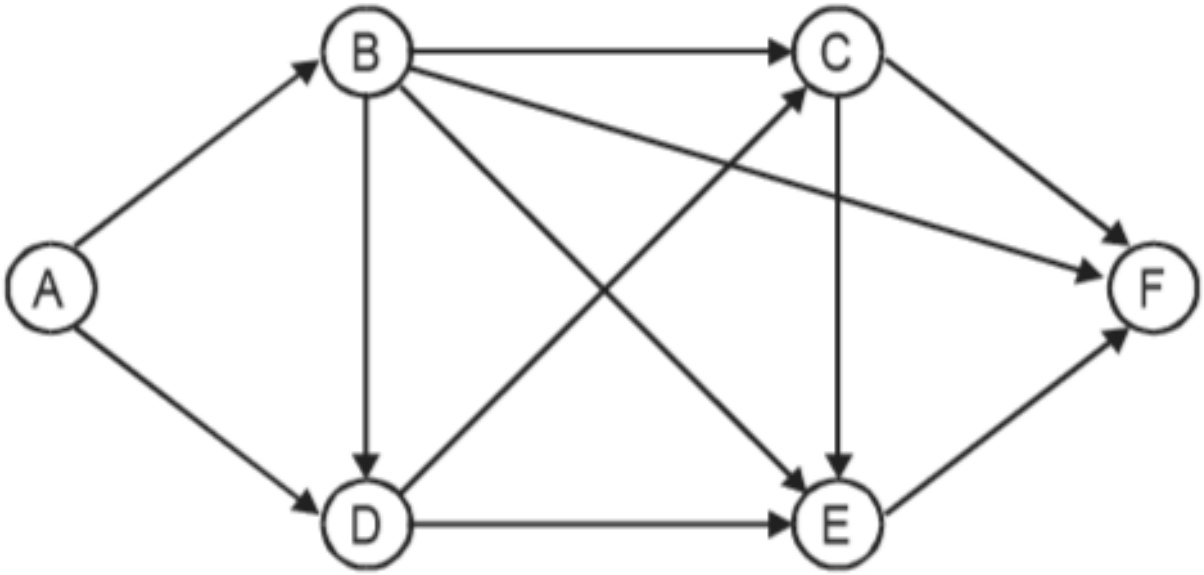
1. 8 2. 9 3. 10 4. 11

Paths

2001

The figure below shows the network connecting cities A, B, C, D, E and F. The arrows indicate permissible direction of travel. What is the number of distinct paths from A to F?

a) 9
b) 10
c) 11
d) None

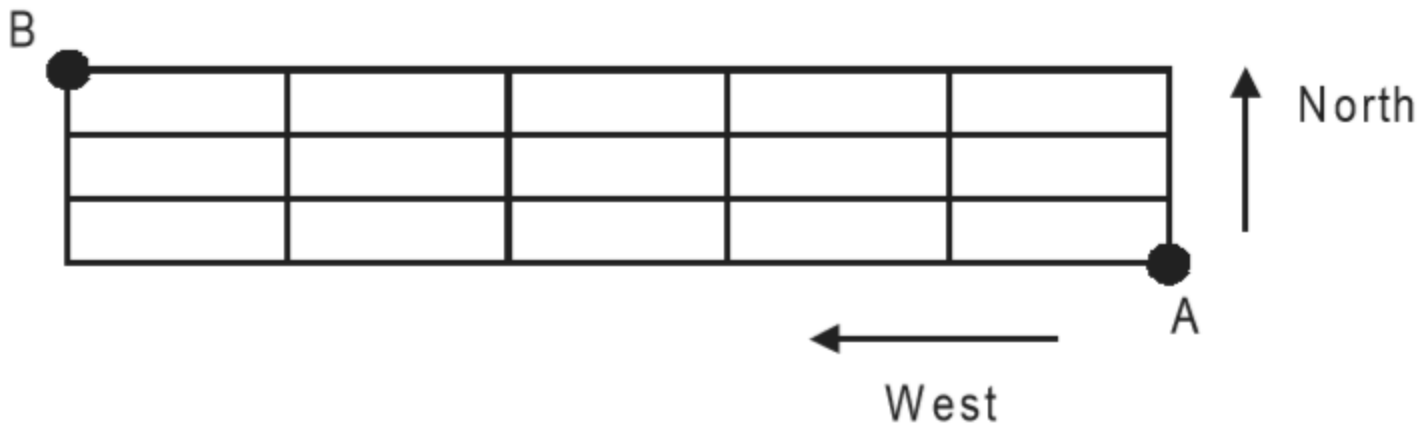


b

2004

In the adjoining figure, the lines represent one-way roads allowing travel only northwards or only westwards. Along how many distinct routes can a car reach point B from point A?

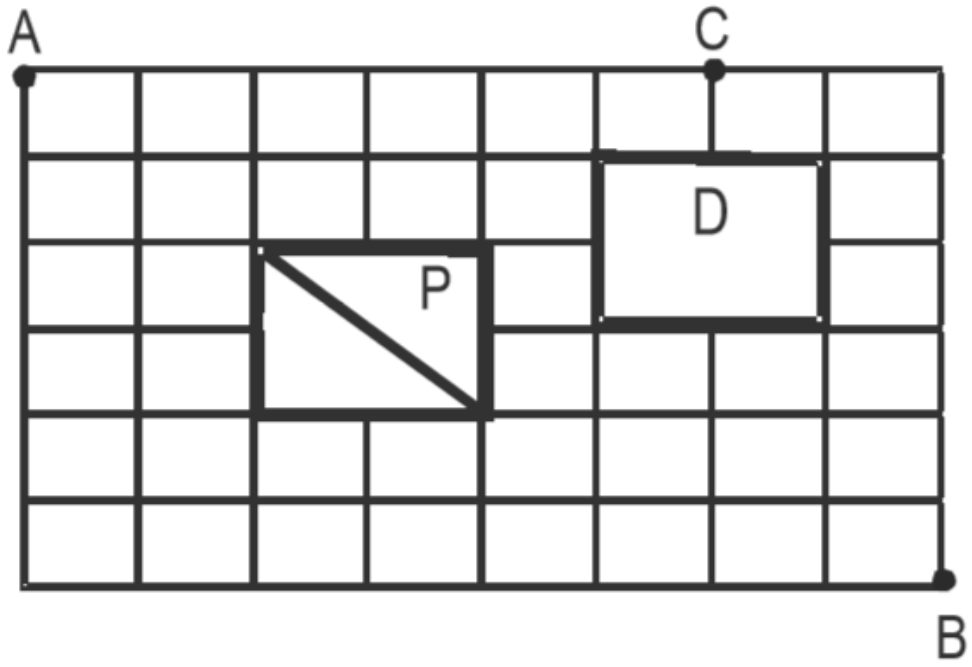
a) 15
b) 56
c) 120
d) 336



b

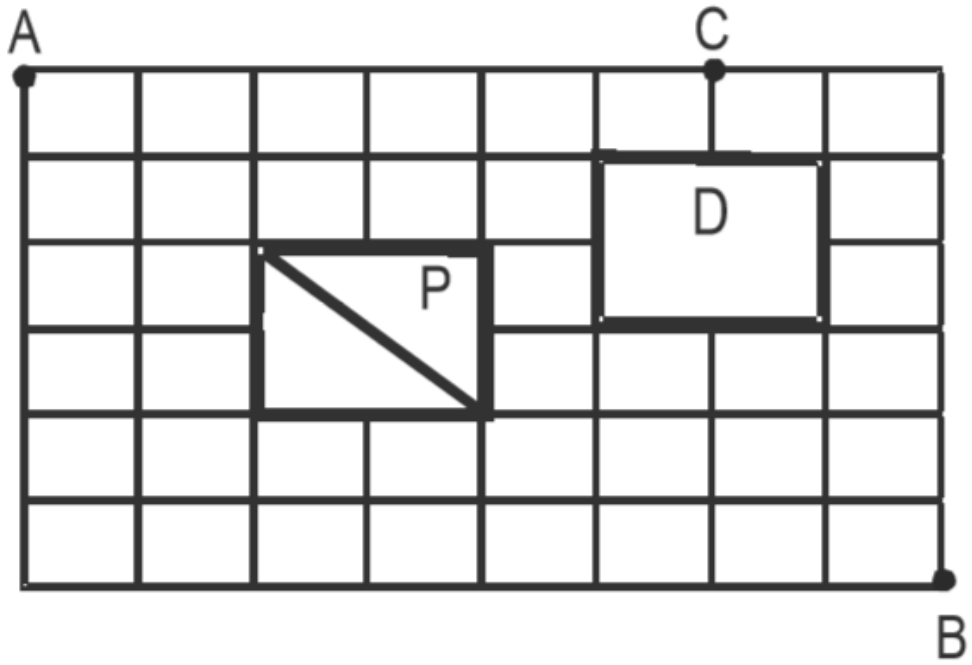
2008

The figure below shows the plan of a town. The streets are at right angles to each other. A rectangular park (P) is situated inside the town with a diagonal road running through it. There is also a prohibited region (D) in the town.
Neelam rides her bicycle from her house at A to her office at B, taking the shortest path. Then the number of possible shortest paths that she can choose is
(1) 60 (2) 75 (3) 45 (4) 90 (5) 72



b

The figure below shows the plan of a town. The streets are at right angles to each other. A rectangular park (P) is situated inside the town with a diagonal road running through it. There is also a prohibited region (D) in the town.
Neelam rides her bicycle from her house at A to her club at C, via B taking the shortest path. Then the number of possible shortest paths that she can choose is
(1) 1170 (2) 630 (3) 792 (4) 1200 (5) 936



Selection

There are 10 points on a line and 11 points on another line, which are parallel to each other. How many triangles can be drawn taking the vertices on any of the line?

(a) 1050
(b) 2550
(c) 150
(d) 1045

A man has nine friends – four boys and five girls. In how many ways can he invite them, if there have to be exactly three girls in the invitees?

(a) 320
(b) 160
(c) 80
(d) 200

Circle

Seven men and seven women have to sit around a circular table so that no 2 women are together. In how many different ways can this be done?

a) 6!*7!

b) 6!*6!

c) 6!*5!

d) 6!*4!

in these type of Q we need to place first the group without any condition ....that is the men here.
which is 6!
after placing them there are exactly seven places in b/n them where the women can be seated satisfying the given condition that no two women are placed next to each other(as there is a men in b/n them).

this can be done in 7!

tot 6!*7!

In how many ways can 8 directors, a vice chairman and a chairman of a firm be seated at a round table, If the chairman has to sit between the vice chairman and the director?

(a) 9! x 2
(b) 6! x 2
(c) 8! x 2
(d) 7! x 2

Numbers

How many five-digit numbers can be formed using the digits 2, 3, 8, 7, 5 exactly once such that the number is divisible by 125?

a. 0 b. 1 c. 4 d. 3

Let us find some of the smaller multiples of 125. They are 125, 250, 375, 500, 625, 750, 875, 1000 ... A five-digit number is divisible by 125, if the last three digits are divisible by 125. So the possibilities are 375 and 875, 5 should come in unit's place, and 7 should come in ten's place. Thousand's place should contain 3 or 8. We can do it in 2! ways. Remaining first two digits, we can arrange in 2! ways. So we can have 2! × 2! = 4 such numbers. There are: 23875, 32875, 28375, 82375.

How many 5 digit numbers can be formed from 1, 2, 3, 4, 5, without repetition, when the digit at the unit's place must be greater than that in the ten's place? a. 54 b. 60 c. 17 d. $2 \times 4!$

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The digit in the unit's place must be greater than that in the ten's place. So if we have 5 in the unit's place, the remaining 4 digits need not be in any particular order. So we will have 4! numbers. However, if we have 4 in the unit's place, we cannot have 5 in the ten's place. Hence, the ten's place has to be one among 1, 2 or 3. This can be done in 3 ways. The remaining 3 digits can be filled in the remaining three places in 3! ways. Hence, total we will have $(3 \times 3!)$ numbers ending in 4. Similarly, if we have 3 in the unit's place, the ten's place can only be 1 or 2. This can be done in 2 ways. The remaining 3 digits can be arranged in the remaining 3 places in 3! ways. Hence, we will have $(2 \times 3!)$ numbers ending in 3. Similarly, we can find that there will be (3!) numbers ending in 2 and no number ending in 1. So total number of numbers satisfying the given condition = $4! + (3 \times 3!) + (2 \times 3!) + 3! = 4! + 6 \times 3! = 24 + (6 \times 6) = 60$

Sam has forgotten his friend's seven-digit telephone number. He remembers the following: the first three digits are either 635 or 674, the number is odd, and the number 9 appears once. If Sam were to use a trial and error process to reach his friend, what is the minimum number of trials he has to make before he can be certain to succeed?
a. 10,000 b. 2,430 c. 3,402 d. 3,006

There are two possible cases. The number 9 comes at the end, or it comes at position 4, 5, or 6. For the first case, the number would look like:
9 635... ...9. 674 In both these cases, the blanks can be occupied by any of the available 9 digits (0, 1, 2, ..., 8). Thus, total possible numbers would be 2 × (9 × 9 × 9) = 1458. For the second case, the number 9 can occupy any of the given position 4, 5, or 6, and there shall be an odd number at position 7. Thus, the total number of ways shall be 2[3(9 × 9 × 4)] = 1944. Hence, answer is 3402.

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Let n be the number of different five-digit numbers, divisible by 4 with the digits 1, 2, 3, 4, 5 and 6, no digit being repeated in the numbers. What is the value of n?

a. 144 b. 168 c. 192 d. None of these

The last two digits can be 12, 16, 24, 32, 36, 52, 56, and 64, i.e. 8 possibilites
Remaining digits can be chosen in P24 3 4 = ways. Hence, total number of such five-digit numbers = 24 × 8 = 192

Range based PnC

Let S be a set of positive integers such that every element n of S satisfies the conditions

I. $1000 \leq n \leq 1200$
II. every digit in n is odd.

Then how many elements of S are divisible by 3?
(1) 9 (2) 10 (3) 11 (4) 12

The 100th and 1000th position value will be only 1 . Now the possibility of unit and tens digits are (1, 3), (1, 9), (3, 1), (3, 7), (5, 5), (7, 3), (7, 9), (9, 1), (9, 7).

Let S be the set of integers x such that
I. $100 \leq x \leq 200$,
II. x is odd and
III. x is divisible by 3 but not by 7.

How many elements does S contain?
a. 16 b. 12 c. 11 d. 13

Numbers which are divisible by 3 (between 100 and 200) are 33. Numbers which are divisible by 21, i.e. LCM of 7 and 3 (between 100 and 200) are 5. Out of the 33 numbers divisible by 3, 17 are even and 16 are odd. Out of the 5 numbers divisible by 7, three are odd. Hence, the number of odd numbers divisible by 3 but not by 7 is (16 – 3) = 13.

Suppose n is an integer such that the sum of digits on n is 2, and $10^{10} < n < 10^{11}$. The number of different values of n is

(1) 11
(2) 10
(3) 9
(4) 8

We have (1) 1010 < n < 1011 (2) Sum of the digits for 'n' = 2 Clearly- (n)min = 10000000001 (1 followed by 9 zeros and finally 1) Obviously, we can form 10 such numbers by shifting '1' by one place from right to left again and again. Again, there is another possibility for 'n' n = 20000000000 So finally : No. of different values for n = 10 + 1 = 11 ans.

Probability

Balls

A bag contains 2 red, 3 green and 2 blue balls, two balls are drawn a random, find the probability that the balls drawn contain no blue balls?

(a) 5/7

(b) 10/21

(c) 2/7

(d) 11/21

A bag contains 3 white and 2 black balls. Another bag contains 2 white and 4 black balls. A bag is selected at random and ball is taken out.

Find the probability that a ball will be white ball?
(a) 7/11
(b) 7/30
(c) 5/11
(d) 7/15

One ball is taken from first bag and dropped in second bag.
Find the probability that a ball selected from bag 2 will be white ball?

Two balls is taken from first bag and dropped in second bag.
Find the probability that a ball selected from bag 2 will be white ball?

Dices

Two dice are tossed, the probability that the total score is a prime number:

(a) 1/6

(b) 5/12

(c) 1/2

(d) 7/9

b

Six dice are thrown, the probability that different number will turn up is:
(a) 129/1296
(b) 1/54
(c) 5/324
(d) 5/54

c

Coins

If six coins are tossed simultaneously, the probability of getting at least one tail is:
(a) 71/72
(b) 53/54
(c) 63/64
(d) 1/12

c

A and B toss a fair coin each simultaneously 50 times. The probability that both of them will not get tail at the same toss is:

(a) $(3/4)^{50}$

(b) $(2/7)^{50}$

(c) $(1/8)^{50}$

(d) $(7/8)^{50}$

b

Matches

In a given race the odds in favour of four horses A, B, C, D are 1:3, 1:4, 1:5, 1:6 respectively. Assuming that, a dead heat is impossible, find the chance that one of them wins the race.

(a) 76%

(b) 88%

(c) 45%

(d) 63%

P(A) = 1/4, P(B) = 1/5, P(C) = 1/6, P(D) = 1/7.
Since the above events are mutually exclusive, the chance that one of them wins
= P(AUBUCUD) = P(A) + P(B) + P(C) + P(D) = (1/4) + (1/5) + (1/6) + (1/7).

The probability that a person will hit a target in shooting practice is 0.3. If he shoots 10 times, then the probability of his shooting the target is

a) 1

b) $1-(0.7)^{10}$

c) $(0.7)^{10}$

d) $(0.3)^{10}$

Target is hit = 1 – no hit = 1–(0.7)10

A speaks truth in 60% of the cases while B speaks truth in 70% of the cases. When they lie they say the same lie. In what percent cases are they likely to contradict each other?

A) 30%

B) 40%

C) 46%

D) 54%

c) 46%

Defects

Buying a mobile phone online is very risky, Probability of buying online and a defective phone is delivered is 50%. I have ordered online 5 times, If a defective phone is delivered 4 times find the probability of the right phone appearing on the 5^{th} delivery?

a) 1/2
b) 1/32
c) 31/32
d) 1/5

Probability that a machine is not defective is 1/5. then probability that out of 5 machines, 4 are defective is ?

a) ${}^5C_4\ (4/5)^2(1/5)$

b) $(4/5)^4(1/5)$

c) ${}^5C_4\ (4/5)^4(1/5)$

d) None

4 machines are there out of which exactly two are faulty. They are tested one by one randomly. Find the probability that only two tests are needed is?

a) 1/3
b) 1/6
c) 1/2
d) 1/4

PnC Based

I forgot the last digit of a 7 digit telephone number. If I randomly dial the final 3 digits after correctly dialling the first four, then what is the chance of dialling the correct number?

a) 1/1001
b) 1/1000
c) 1/999
d) 1/990

A positive integer N is selected such that 100<N<200. the probability that it is divisible by either 4 or 7 is?

a) 38/99
b) 24/99
c) 34/99
d) 14/99

Seven people seat themselves at a round table. The probability that two distinguished persons will be next to each other is?

a) 1/3
b) 1/2
c) 1/4
d) 2/3

Twenty cards are there in a box. 5 of them contain I printed on them, 15 of the remaining have M printed on them. Three cards are drawn at random. Find the probability word IIM is formed?

a) 1/32
b) 3/64
c) 1/64
d) 3/32
e) None of these