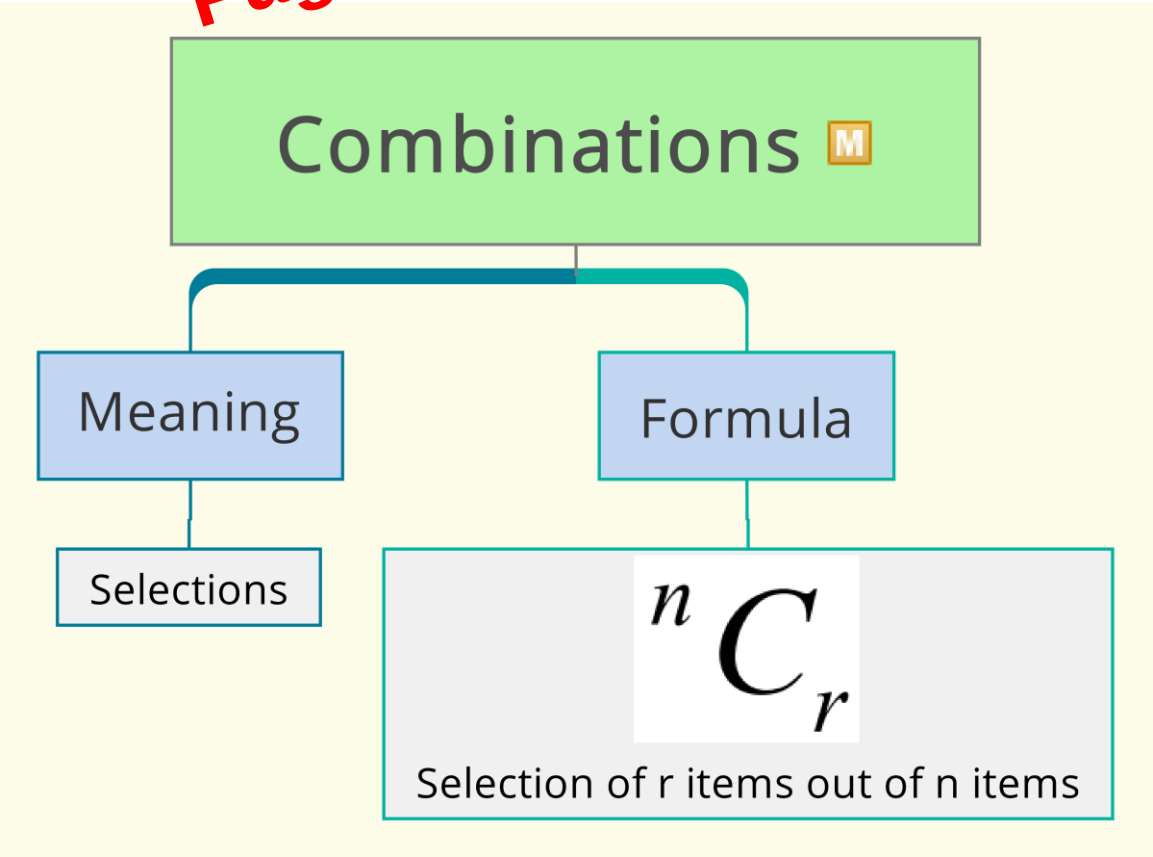

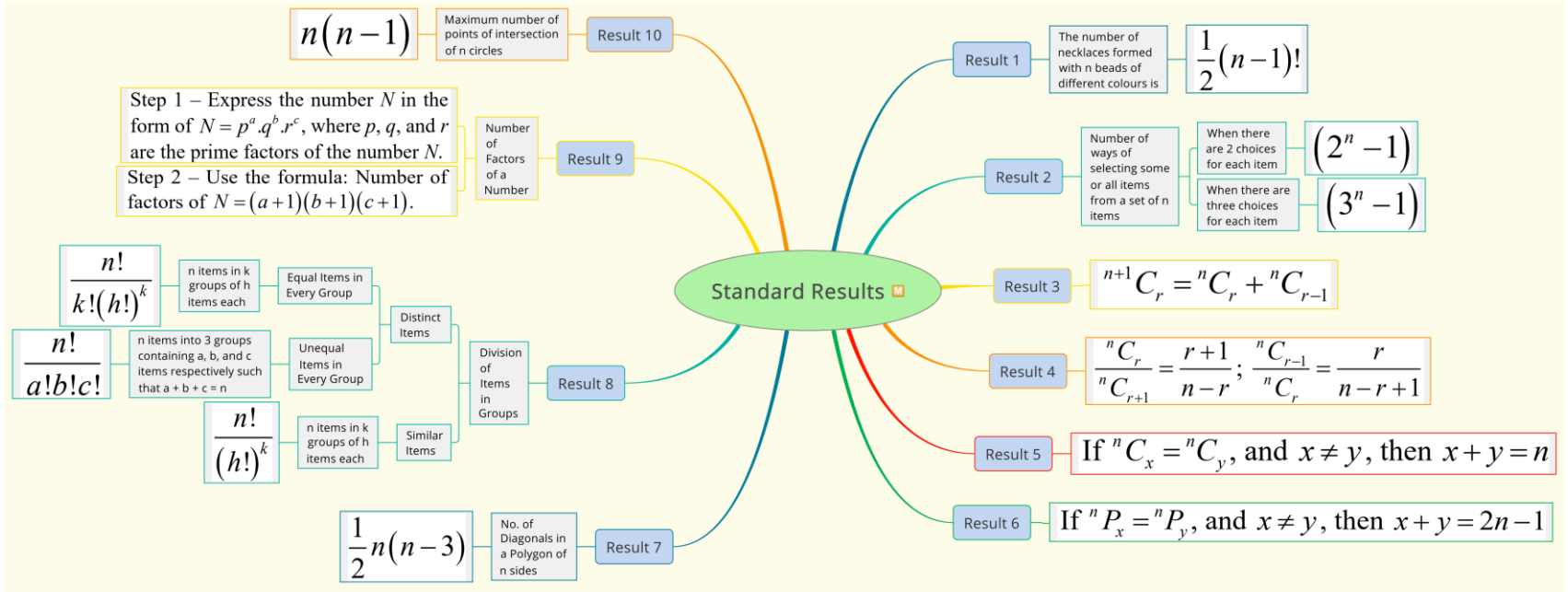

Question 6

In ${}^{n}P_{r} = n(n-1)(n-2)...(n-r+1)$, the number of factors is:

(a) n (b) $r-1$ (c) $n-r$ (d) r

Question 22

There are 6 books on Economics, 3 on Mathematics and 2 on Accountancy. In how many ways can these be placed on a shelf if the books on the same subject are to be together?

(a) 1,440 (b) 51,840 (c) 52,740 (d) None

Question 26

The number of permutations of 10 different things taken 4 at a time in which one particular thing never occurs is:

(a) 3,020 (b) 3,025 (c) 3,024 (d) None

Question 37

Question 44

The number of parallelograms that can be formed from a set of four parallel lines intersecting another set of three parallel lines is:

(a) 6 (b) 18 (c) 12 (d) 9

Question 45

The Supreme Court has given a 6 to 3 decision upholding a lower court; the number of ways it can give a majority decision reversing the lower court is:

(a) 256 (b) 276 (c) 245 (d) 226

Question 49

Question 51

A committee of 3 ladies and 4 gents is to be formed out of 8 ladies and 7 gents. Mrs. X refuses to serve in a committee in which Mr. Y is a member. The number of such committees is:

(a) 1530 (b) 1500 (c) 1520 (d) 1540

Question 54

Question 58

5 persons are sitting in a round table in such way that Tallest Person is always on the right–side of the shortest person; the number of such arrangements is:

(a) 6 (b) 8 (c) 24 (d) None

Question 63

Question 74

If ${}^{n}P_{r} = {}^{n}P_{r+1}$, and ${}^{n}C_{r} = {}^{n}C_{r-1}$, then find the value of n.

(a) 3 (b) 4 (c) 5 (d) 6

Solution

(a)

We know that if ${}^{n}P_{x} = {}^{n}P_{y}$, and $x \neq y$, then $x + y = 2n - 1$. Therefore, $r + r + 1 = 2n - 1$.

$$\Rightarrow 2r + 1 = 2n - 1 \Rightarrow 2r = 2n - 2 \Rightarrow r = \frac{2n-2}{2} \Rightarrow r = n - 1.$$

Question 76

If a polygon has 44 diagonals, then the number of sides are:

(a) 6 (b) 7 (c) 8 (d) 11

Solution

(d)

The number of diagonals in a polygon of n sides is $\frac{1}{2}n(n-3)$.

$$\frac{1}{2}n(n-3)=44$$

Question 78

The number of ways in which 9 things can be divided into twice groups containing 2, 3, and 4 things respectively is:

(a) 1250 (b) 1260 (c) 1200 (d) None

Solution

(b)

The number of ways to divide n items into 3 groups → one containing a items, the second containing b items, and the third containing c items, such that $a+b+c=n$, is given by $\frac{n!}{a!b!c!}$.

Therefore, $\frac{n!}{(h!)^k} = \frac{15!}{(5!)^3} = 7,56,756.$

Question 80

The number of different factors of the number 75,600 has is:

(a) 120 (b) 121 (c) 119 (d) None

Solution

(c)

$75,600 = 2^4.3^3.5^2.7$

Therefore, total number of factors of 75,600 $= (4+1)(3+1)(2+1)(1+1) = 120$

Question 81

The maximum number of points of intersection of 10 circles will be _____.

(a) 90 (b) 100 (c) 110 (d) 120

Solution

The maximum number of points of intersection of n circles will be $n(n-1)$.

Therefore, $10(10-1)=10\times 9=90$.