Permutations and combinations   <u>Solutions</u>   <u>Main Menu</u>

77 The numberplates for motor vehicles consist of 2 letters, 2 numbers and then 2 letters such as AB01CD. How many different numberplates are possible?
(A) 135 200
(B) 270 400
(C) 37 015 056
(D) 45 697 600

78 The number plates for motor vehicles consist of 3 consonants followed by 3 digits such as BBC012. How many different number plates are possible?
(A) 6 751 269
(B) 9 261 000
(C) 12 812 904
(D) 17 576 000

79 How many four-digit numbers can be formed with the digits 1, 2, 3, 4 and 5 if no digit is repeated?
(A) 20
(B) 120
(C) 625
(D) 3125

80 How many numbers greater than 3000 can be formed with the digits 2, 3, 4, 5 and 6 if no digit is used more than once in a number?
(A) 96
(B) 120
(C) 196
(D) 216

81 How many arrangements of all of the letters of the word TRIGONOMETRY are possible?
(A) 59 875 200
(B) 119 750 400
(C) 239 500 800
(D) 479 001 600

82 How many arrangements of all of the letters of the word ADDITION are possible?
(A) 720
(B) 10 080
(C) 20 160
(D) 40 320

83 How many distinct permutations of the letters of the word 'DIVIDE' are possible in a straight line when the word begins and ends with the letter D?
(A) 12
(B) 180
(C) 360
(D) 720

84 A committee of 5 is to be chosen from 9 candidates. How many different ways can this be done?
(A) 45
(B) 120
(C) 126
(D) 15 120

85 How many possible combinations are possible if two people are chosen from a group of ten people?
(A) 2
(B) 45
(C) 90
(D) 100

86 In a class of 15 students, there are 9 boys and 6 girls. The class elects four representatives for the student council. How many different groups of representatives are possible?
(A) 1365
(B) 3240
(C) 5005
(D) 32 760

87 In a class of 23 students, there are 12 boys and 11 girls. The class needs to elect two boys and two girls for the student council. How many different representatives are possible?

(A) 121

(B) 3630

(C) 8855

(D) 14 520

88 How many ways can six children be arranged around a circular table?

(A) 120

(B) 600

(C) 720

(D) 5040

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	Solution	**Criteria**
77	Number of arrangements $= 26^2 \times 10^2 \times 26^2$ (21 consonants) $= 45\ 697\ 600$	1 Mark: D
78	Number of arrangements $= 21^3 \times 10^3$ (21 consonants) $= 9261000$	1 Mark: B
79	If all 5 digits are used: Number of permutations $= 5! = 120$	1 Mark: B
80	If all 5 digits are used: Number of permutations $= 5! = 120$ If only 4 digits are used: Number of permutations $= 4 \times 4 \times 3 \times 2 = 96$ Therefore Total $= 216$	1 Mark: D
81	Number of arrangements $= \dfrac{12!}{2! \times 2! \times 2!}$ (2 T's, 2 R's and 2 O's) $= 59\ 875\ 200$	1 Mark: A
82	Number of arrangements $= \dfrac{8!}{2! \times 2!}$ (2 I's and 2 D's) $= 10080$	1 Mark: B
83	Place the D at the start and end. $\dfrac{4!}{2!} = 12$	1 Mark: A
84	$^9C_5 = 126$	1 Mark: C
85	$^{10}C_2 = 45$	1 Mark: B
86	$^9C_5 = \dfrac{15!}{11! \times 4!} = 1365$	1 Mark: A
87	Order is not important $^{12}C_2 \times {}^{11}C_2 = 66 \times 55$ $= 3630$	1 Mark: B
88	Arrangements $= = (n-1)!$ $= 5!$ $= 120$	1 Mark: A