NAME	COLLEGE	DESK NUMBER
MCLELLAN	SID	138

EXAMINATION	SUBJECT OF PAPER
MATHS 1B	PAPER 4

Numbers of questions attempted

3

Read carefully any inst

Write on one side of the

Start each answer on a fr

Arrange your answers in

Tie the sheets securely tog

Write, your name, college, subject of the paper in th

Write the numbers of the qu the right.

Candidates are expected to those who do not may find t a grave disadvantage.

It is forbidden to remove any writing-paper, whether written on or not, or blotting-paper, from the examination-room.

Neil [91]

A522, A6231

I had occasion to look at the graph whose $n!$ vertices are the perms of n things, two vertices being joined just if you can get from one to the other by a single cycle (of length 2 or more).

Its valence $\Delta_n = \frac{n(n-1)}{2} + \frac{n(n-1)(n-2)}{3} + \cdots + \frac{n!}{n}$

is not in the Good Book. Here is some info:

P_n is the (total) # of perms (seq. 589 in)

$$P_n = nP_{n-1} + 1 \quad = A522$$

$$\Delta_{n+1} - \Delta_n = nP_{n-1} = P_n - 1$$

A522

n =	0	1	2	3	4	5	6	7	8	9
P_n =	1	2	5	16	65	326	1957	13700	109601	986410
Δ_n =	?	0	1	5	20	84	409	2365	16064	125664

A6231

n =	10	11	12	13	14
P_n =	9864101	108505112	1302061345	16926797486	236975164805
Δ_n =	1112073	10976173	119481284	1421542628	18348340113

n =	15	16	17
P_n =	3554627472076	56874039553217	
Δ_n =	255323504917	3809950976992	60683990530208

R. K. Guy

77:07:09

[wrote via Calgary asking you to ref. a paper for Monthly Res. Problems sect. – doubt if you have it yet]