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Part I.

1. Who were the two genuises who proved the impossibility of a formula for solving a quinic?

Abel and Galois

2. Find a way to place 31 domino piece, and cover completely an 8 by 8 square, where two opposite have been removed?

It is impossible.

3. At what ages did the above geniuses did?

Abel: 27, Galois 21.

4. What university did the most in the classification of simple groups and have quite a few faculy members with groups named after them?

Part II.

1. $1 \to 4$, $4 \to 6$, so $1 \to 6$

$2 \to 5$, $5 \to 7$, so $2 \to 7$

$3 \to 7$, $7 \to 5$, so $3 \to 5$

$4 \to 6$, $6 \to 4$, so $4 \to 4$

$5 \to 1$, $1 \to 3$, so $5 \to 3$

$6 \to 2$, $2 \to 1$, so $6 \to 1$

$7 \to 3$, $3 \to 2$, so $7 \to 2$

So the product : $\begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 \\ 6 & 7 & 5 & 4 & 3 & 1 & 2 \end{pmatrix}$

2. $\pi^2 = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 3 & 4 & 1 & 2 \end{pmatrix}$ $\pi^3 = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 2 & 3 & 4 & 1 \end{pmatrix}$ $\pi^4 = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 1 & 2 & 3 & 4 \end{pmatrix}$,

which is the identity permutation.

3. $\begin{pmatrix} 1 & 3 & 2 \\ 3 & 2 & 1 \end{pmatrix}\begin{pmatrix} 4 & 5 \\ 5 & 4 \end{pmatrix}$

The smallest $i = 2 \times 3 = 6$

4. $\begin{pmatrix} 3 & 1 & 2 & 5 & 4 \\ 1 & 2 & 3 & 4 & 5 \end{pmatrix}$, $\pi^{-1} = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 \\ 2 & 3 & 1 & 5 & 4 \end{pmatrix}$