

Real Quiz # 8 for Dr. Z.'s MathHistory

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Email DrZlinear@gmail.com as soon as I tell you (around 3:15pm)

Subject: q8

with an attachment called

q8FirstLast.pdf (e.g. q8PaulErdos.pdf)

1. (2 points) What is Laplace's partial differential equation? Who derived it before Laplace?

$$\frac{\partial^2 V}{\partial x^2} + \frac{\partial^2 V}{\partial y^2} + \frac{\partial^2 V}{\partial z^2} = 0 \quad \text{Euler did.}$$

2. (2 points) What is the name of the city where Carl Friedrich Gauss was born? What was the occupation of his father?

Brunswick, butcher

3. (2 point) Can the side-length of a regular polygon of 17 sides (inscribed in a circle of radius 1) be constructed with compass and ruler alone? Who proved (or disproved) it?

yes, Gauss proved it

4. (4 points altogether)

Consider the set

$$G = \{0, 1, 2, 3, 4, 5\}$$

where the "multiplication", let's call it "*", is addition modulo 6, for example: $2 * 3 = 5$, $4 * 5 = 3$.

- a (1 point) Show that it is a group.

It is a group because it contains the inverses, the set through lin algebra is not

- b (1 point) Is the subset $\{1, 3, 5\}$ of G a subgroup of G ? Explain!

yes

c (1 point) Show that $H = \{0, 2, 4\}$ a subgroup of G .

d (1 point) Find the coset decomposition of G with respect to H .