Remember:

- Include the team name.
- For math tasks, solve each one separately. The process of reasoning must be clear.
- Send your solutions to geomatical@gynome.cz before the end of March.
- See you all in the Final in May in Nové Město.

We would like to stress the importance of submitting your answers to the geographical part in a clear digital format. Keep in mind that illegible, poorly photographed and/or otherwise deficient answers may not be awarded points.

Round 3

Geography

Terrorism

This round's focus is the global issue of terrorism. Utilizing the data of the Global Terrorism Database[1] (GTD) (https://www.start.umd.edu/gtd/) find answers to the following questions:

1. Trends in Global Terrorism (4 pts)

   Study the text found here:
   https://www.start.umd.edu/sites/default/files/publications/local_attachments/START_GTD_TerrorismIn2018_Oct2018.pdf
   and decide if the following sentences are true or false. Correct the false statements.

   a) The period between 2014 and 2018 saw a decrease in the total number of terrorist attacks worldwide by 43%, but an increase of deaths by 48%.

   b) There were nine deadly terrorist attacks in Western Europe in 2018. The most serious, resulting in 11 causalities, took place at a Christmas market in Strasbourg.

   c) More than a half of all 2018's terrorist attacks occurred in Afghanistan, Iran, India, Nigeria, and the Philippines alone.

   d) The biggest rise of terrorism between 2017 and 2018 was recorded in Cameroon. The number of attacks increased by 114%.

   e) The number of deaths associated with terrorist attacks in Afghanistan is typically highest in summer (compared to other seasons).

   f) There was a significant increase in terrorist attacks in Iraq in 2018.

   g) The number of recorded attacks in 2018 was larger in Greece than in France.

   h) The perpetrators in all six deadly attacks in the USA in 2018 were supporters of far-left ideologies.

[1] The Global Terrorism Database (GTD) is an open-source database including information on terrorist events around the world since 1970 (currently updated through 2018). For each GTD incident, information is available on the date and location of the incident, the weapons used and nature of the target, the number of casualties, and – when identifiable – the identity of the perpetrator.

2. Terrorist Attacks in Nigeria (3 pts)

Use the GTD data (https://www.start.umd.edu/gtd/) and create a document in which there will be information about terrorist attacks in Nigeria including:

a) a snapshot of a graph depicting the number of incidents over the time period of 2010–2018 with a brief commentary/description,

b) a snapshot of a graph depicting the types of weapons used in the 2010–2018 attacks with a brief commentary/description,

c) the following table complete with data about the deadliest attack in the aforementioned period.

Date	
Place	
Number of fatalities	

3. Mapping Terrorism in Afghanistan (5 pts)

a) Use the GTD (https://www.start.umd.edu/gtd/) and complete the following table with information about all 2015–2018 terrorist attacks in Afghanistan with over 100 confirmed fatalities:

Date	Place	Terrorist group	Number of fatalities

b) Choose an appropriate cartographic method to illustrate both the place and the number of fatalities of the attacks from 3a) in an otherwise blank map of Afghanistan. Feel free to use the following link https://commons.wikimedia.org/wiki/File:Afghanistan_provinces_blank.png.

Maths

1. Prove:

$$\forall n \in \mathbb{N}: \quad \left(\frac{10^n - 1}{81} - \frac{n}{9}\right) \in \mathbb{Z}$$

2. Graph the function $f(x)$, where:
   $x \in [-3, \infty) - \{0\}$
   $f(-3) = -2$
   The graph intersects the x-axis in $P_1 = (-1,0)$ and $P_2 = (5,0)$.
   f is increasing and not bounded above in $[-3,0)$.
   f is even in $[-3, 3] - \{0\}$.
   f is increasing and bounded above by $A = 4$ in $[3, \infty)$.

   Using the graph determine:

   a) the image of f (i.e. the set of all output values of f),

   b) the coordinates of the point in which the graph intersects the y-axis,

   c) if f is bounded below,

   d) the maximum value of f.

3. The length of a rectangular-shaped property is shorter than three times its width by eight metres. If the width was increased by 5% of the length and the length decreased by 14% of the width, the perimeter of the rectangle would be 30 metres longer. What are the dimensions of the property?