GLOBAL LOGIC & REASONING COMPETITION

Qualification Round

EDITION 2026

Problem A: Backstage (5 Points)

A festival's entry system runs on two rules: (R1) everyone holding a backstage pass also has a VIP wristband; (R2) no one on the volunteer crew holds a backstage pass. You also know that *Priya has a VIP wristband* and *Marco is on the volunteer crew*.

For each statement, say whether it **must be true**, **must be false**, or **cannot be determined**, with a one-line reason.

(a) Marco does not have a backstage pass.

(b) Priya has a backstage pass.

(c) Marco has no VIP wristband.

(d) Someone has a backstage pass but no VIP wristband.

Problem B: Age brackets (5 Points)

GLRC sorts students into three groups by their grade and age on the submission deadline:

- **Junior:** 10th grade or below *and* under 16.
- **Youth:** 11th to 13th grade, *or* 16 and older.
- **Senior:** in 1st-year university or higher, *or* 19 and older.

Let g be the student's high-school grade, let a be their age in whole years, and let U mean "enrolled in 1st-year university or higher."

(a) Write a precise condition, in terms of g, a, and U, for each of the three groups.

(b) These rules let one student fall into two groups at once. Describe such a person and propose a solution that matches every student to exactly one group.

Problem C: The healthcare machine (5 Points)

A company sells an AI that reads retinal scans for a rare disease and advertises it as "98% accurate." Precisely: if a patient has the disease, the AI flags them 98% of the time; if a patient is healthy, it wrongly flags them 4% of the time. The disease affects about 1 in 500 people. A hospital screens *everyone* who walks in, and you are flagged positive.

(a) What is the probability that you actually have the disease? Explain the result.

(b) The same AI is instead used only on patients a specialist has already referred, where about 1 in 5 truly have the disease. Roughly what is the probability now?

Problem D: Ask the AI (5 Points)

A student asks an AI, "Should I still learn to code?" It replies:

> "No. Modern AI can already turn a plain-English description into working code. Since the AI does the coding, human coders are no longer needed. Anything that takes years to learn but can be automated is not worth the effort — and learning to code takes years. Therefore, learning to code is a waste of time."

(a) Name the hidden assumption(s) the argument relies on but never states.

(b) Point to the exact sentence where the reasoning stops following, and say why.

Problem E: How many take the TOEFL? (5 Points)

The TOEFL is an English-proficiency exam, taken mostly by non-native speakers for university admission or visas. Estimate how many people sit the TOEFL worldwide in a typical year. Build the estimate from a few explicit assumptions, show the chain that leads to the number, and give a single figure with a plausible range. You are judged on the model's structure and defensibility, not on matching the true value.

Participation Instructions

- ✓ Write your solutions by hand on sheets of paper or type them on a computer.
- ✓ **Submit your solutions online by the deadline shown on the website.**
  Website: `https://gllrc.org/submission`
- ✓ You do not need to include the problem statements in your solution document.
- ✓ Show your work to receive full marks. Maximum points: **25**.
- ✓ Clearly label each problem and highlight your final answers.
- ✓ You need to score at least **8/10/12 points** as Junior/Youth/Senior to qualify for the Semi-Final Round. See `https://gllrc.org/age-groups` for details.
- ✓ If you have questions, reach out to us at: `info@gllrc.org`