

Proof by Mathematical Induction

Purpose

You will succeed in this activity if you collaborate with your teammates to contribute to three proofs by induction. Your team will make sense of and accurately build on the steps created by other teams. Be patient with yourselves and others in creating clear written communication about details in developing and presenting the proofs.

Introductions and Teamwork Prep

When you get with your team, each student shares the following:

- **Name:** Provide your preferred name and (if you want to) pronoun.
- **Fact:** Share something that other people might not know about you.

After introductions, decide each member's role within your team using the Roles Rules given by your instructor. The roles are as below:

- **Facilitator:** manages resources and makes sure everyone participates meaningfully
- **Documenter:** is responsible for the *final* version for presenting the solution w/visual aids
- **Reporter:** leads the presentation of team's work to the class
- **Questioner:** asks/nudges the group about ideas, asks questions of teacher/other teams

PRINT first and last names next to your work and in the table below for who has which role:

Facilitator	Documenter	Reporter	Questioner

Proof-by-Assembly Line Activity

Your instructor will give you a slip of paper with a Claim. In your group you will assign roles and work on the first stage, beginning the proof of that Claim. After a few minutes, you will move to the space for another Claim to complete the proof of that second Claim. Finally, after a few more minutes, you will move to a third Claim and validate it (determine its accuracy and truth).

Stage 1: Start the proof of a Claim. Begin a proof of your team's assigned Claim. Write the claim AND complete the basis step AND state the inductive hypothesis.

Stage 2: Finish the proof of another Claim. Physically move to the next proof, the result of Stage 1 for another team. As a team, review what the other team wrote AND decide how to write and justify the induction step AND complete the proof. If needed, you can confer with the team who started the proof to generate the completion of their proof. **Provide enough written comment/annotation so the *next* team has support for understanding *why* each of the written statements is in the proof.**

Stage 3: Validate the proof of a third Claim. Move to the next proof, where two other teams have already completed Stage 1 and Stage 2. As needed, **correct** the proof AND then **validate** (confirm) the proof AND get ready to present the proof to the class. **Prepare for your team's presentation by deciding how to explain your team's steps for correcting and validating the proof.**

After working through all three stages, the whole class will go over the proofs.

Student Feedback Survey

Please share your feedback on this lesson through a short survey. Use the link <https://forms.gle/t98BA78VxqFRysoaA> or the QR code to the right.

