# San Diego Math Circle
# F=ma Physics 2027

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# What is the F=ma Exam?

- The F=ma Exam is offered annually by the American Association of Physics Teachers (AAPT).
- F=ma Exam results are used to invite participants to the United States Physics Olympiad (USAPhO).
- The USAPhO results are used to create the US team for the International Physics Olympiad (IPhO).

# Who can take the F=ma Exam?

- Anyone who is a U.S. Citizen or Permanent Resident and is high school age and younger may take the F=ma Exam.
- There is no limit on how many years in a row you may take the F=ma Exam, as long as you are eligible to take it.
- More specific details are on the AAPT site.

# When is the F=ma Exam?

- The F=ma Exam is offered once per year, in early- or mid-February. Sometimes there are two exams each year, but within a few days of each other.

- This class will run from now until the Exam.

# Who should take the F=ma Exam?

- The F=ma Exam is best approached by students who will have taken a full mechanics course by the exam date.
- A full-year physics course is more than sufficient, **if** it covers mechanics in the first semester.
- A full-year physics course which covers **only** mechanics will require getting ahead of the course material in time for the exam.

# Who should take the F=ma Exam?

- However, it also helps if you have previous experience with the F=ma Exam.
- So, if you are interested in the F=ma Exam but don't think you're quite ready, I encourage you to study a bit, take it, and see how it goes.
- It is much easier to qualify if you've taken one F=ma Exam and have some idea of what it takes before you "really try".

# Who does take the F=ma Exam?

- Several thousand students each year.
  Last year, over **6,600** — 10%+ increase from 2025!

- Approximately **400** students "pass" the F=ma Exam.
  These students qualify to participate in the USAPhO.

$$\frac{400}{6600} \approx 6\,\%$$

# What makes the F=ma Exam different from math competitions?

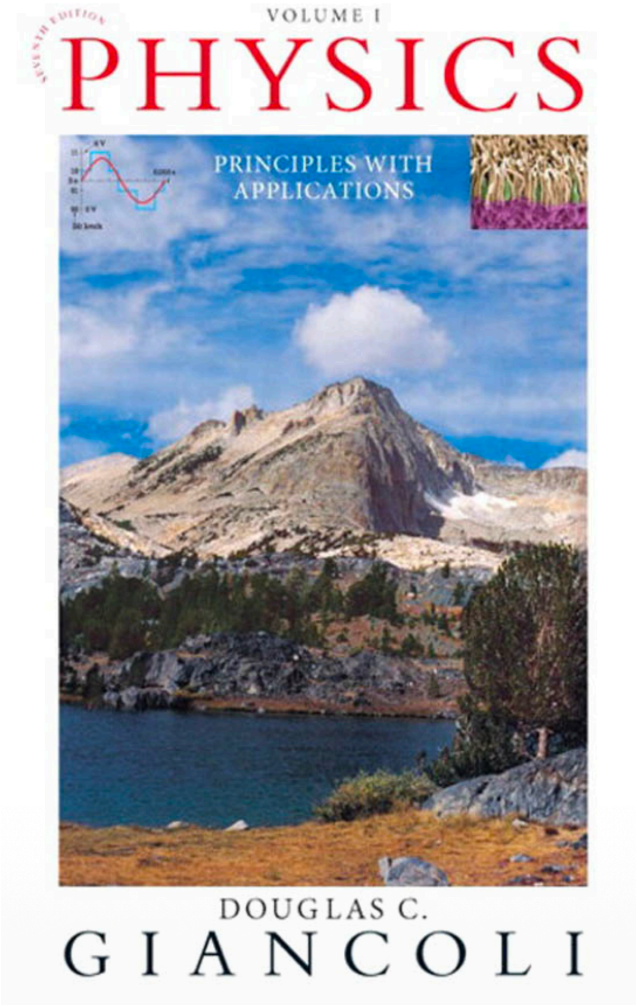
- **Experience.**
- Consider the AMC 10. A typical AMC 10 competitor has studied math for **10 years**.
- In contrast, a typical F=ma entrant has studied physics for **1 semester**.
- A typical USAPhO qualifier will have studied physics for **≥ 1½ years**, and have taken the F=ma Exam at least once before.

# What content does the F=ma Exam cover?

- Mostly mechanics, with some fluids.
- Knowing basic trigonometry is required.
- Basic calculus concepts (simple derivatives and integrals) make some topics easier, but are certainly not required.

# What content does the F=ma Exam cover?

- ***Physics***, *Principles with Applications, Seventh Edition* by Giancoli, Ch. 1-8, 10-11 is a representative algebra-based curriculum.



# Who should join this course?

- If you have the intention to take the **F=ma Exam in 2027** as your first or second attempt, **you are the target demographic of this course**, and should join us!

- If you are currently **taking a class which covers these physics topics**, you may find this **course helpful anyway** even if you're not sure about the F=ma Exam.

- I do not recommend this course if you have not taken any physics and are not taking any concurrently, but you are still welcome to join and participate.

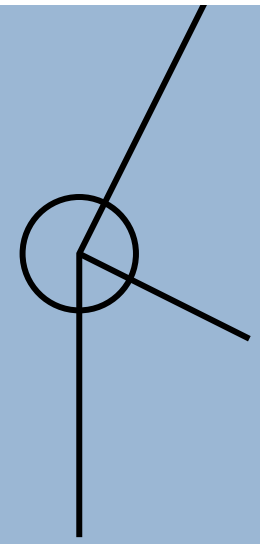
# What will you get out of participating in this course?

- This course is designed as a support for students who want to take the F=ma Exam and already have some physics knowledge.
- Most of the course will focus on applying physics knowledge you already have to problems in the F=ma style, problem solving techniques, and practice exams.
- As such, this course will **not** be teaching the basic concepts you learn in a course like AP Physics 1.

# What content will be covered in this course?

- Besides practice problems and full practice exams, I deliver several mini-lectures about specific topics throughout the season.

- The content of the mini-lectures have been written up into ***F=ma Physics (2nd ed.)***
  *A Review of Concepts and Techniques for the F=ma Exam*
  which is available on my website: saret.co/teaching

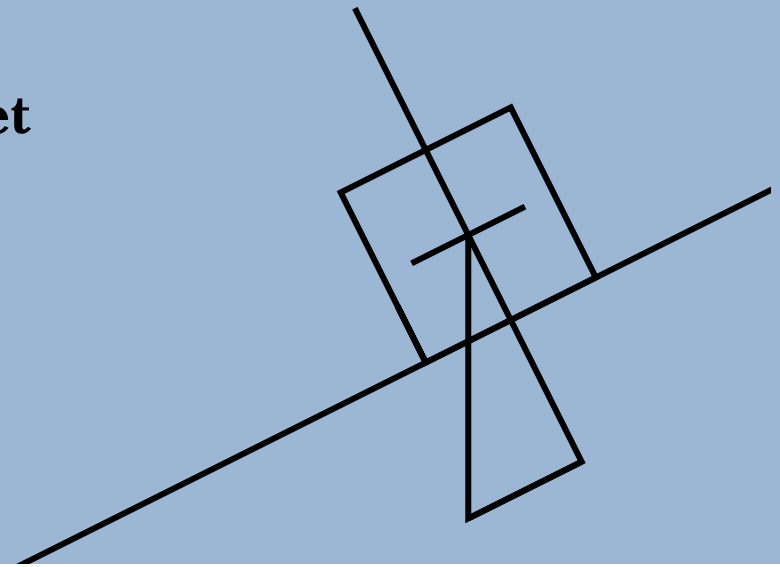


# $\Sigma\vec{F}=m\vec{a}$ Physics

SECOND EDITION

**A Review of Concepts and Techniques for the $\Sigma\vec{F}=m\vec{a}$ Exam**

**Jacob Saret**



# If you're interested in joining the course, let me know!

**Interest form:**
https://docs.google.com/forms/d/e/1FAIpQLSdoo5OuUKPIZloBIP60fM9WXQe9ohq6jn9VrqY2BWQn6lBfqw/viewform?usp=header

**Scheduling form:**
https://docs.google.com/forms/d/e/1FAIpQLSejqRexLG5qOkULxZx29rbjsuTwJWCyWCZs7JDBz7SzKFa-JA/viewform?usp=header

These links will be in the Zoom chat, too.

# Questions?