

Lecture 14

Problems

Table of Contents

1) Ingredients

2) The 4 problems

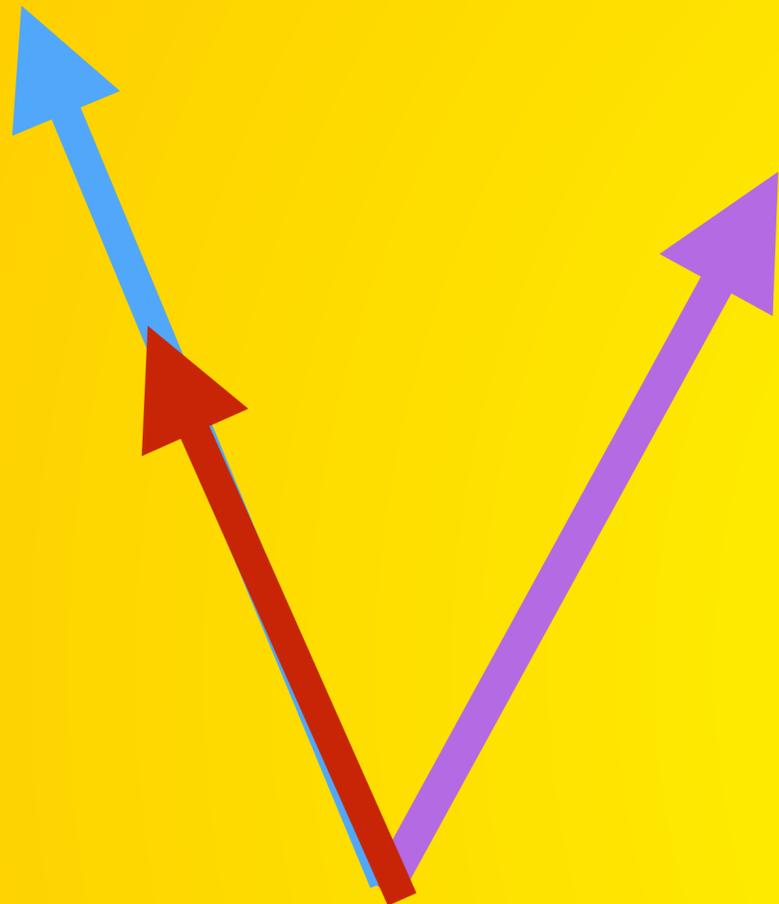
3) Problem Solving

4) Working on Presentation

5) Presentation

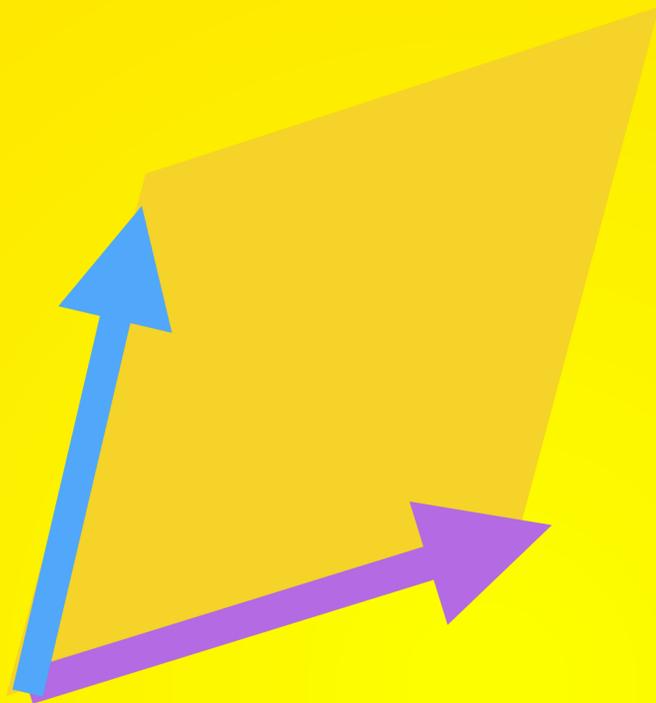
Ingredients

Projection



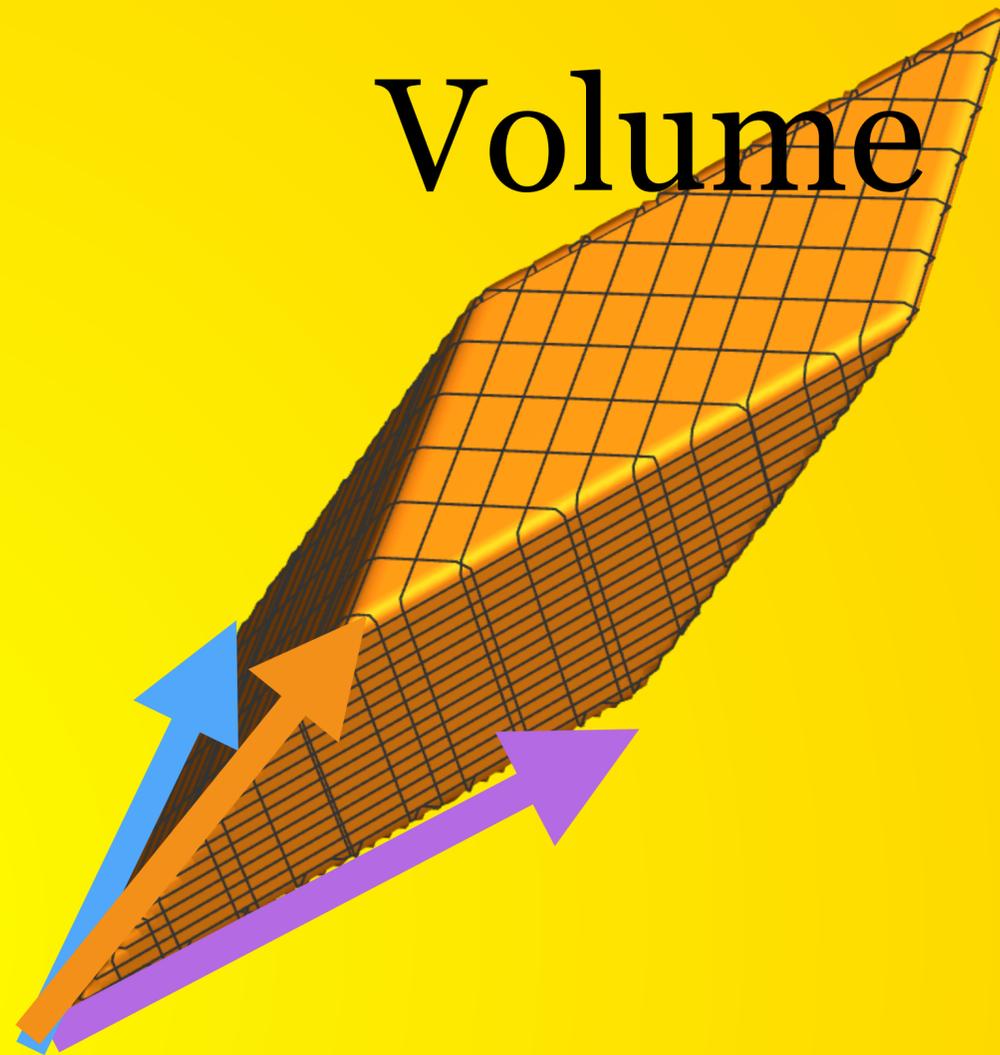
$$\frac{\vec{v} \cdot \vec{w}}{\|\vec{w}\|}$$

Area



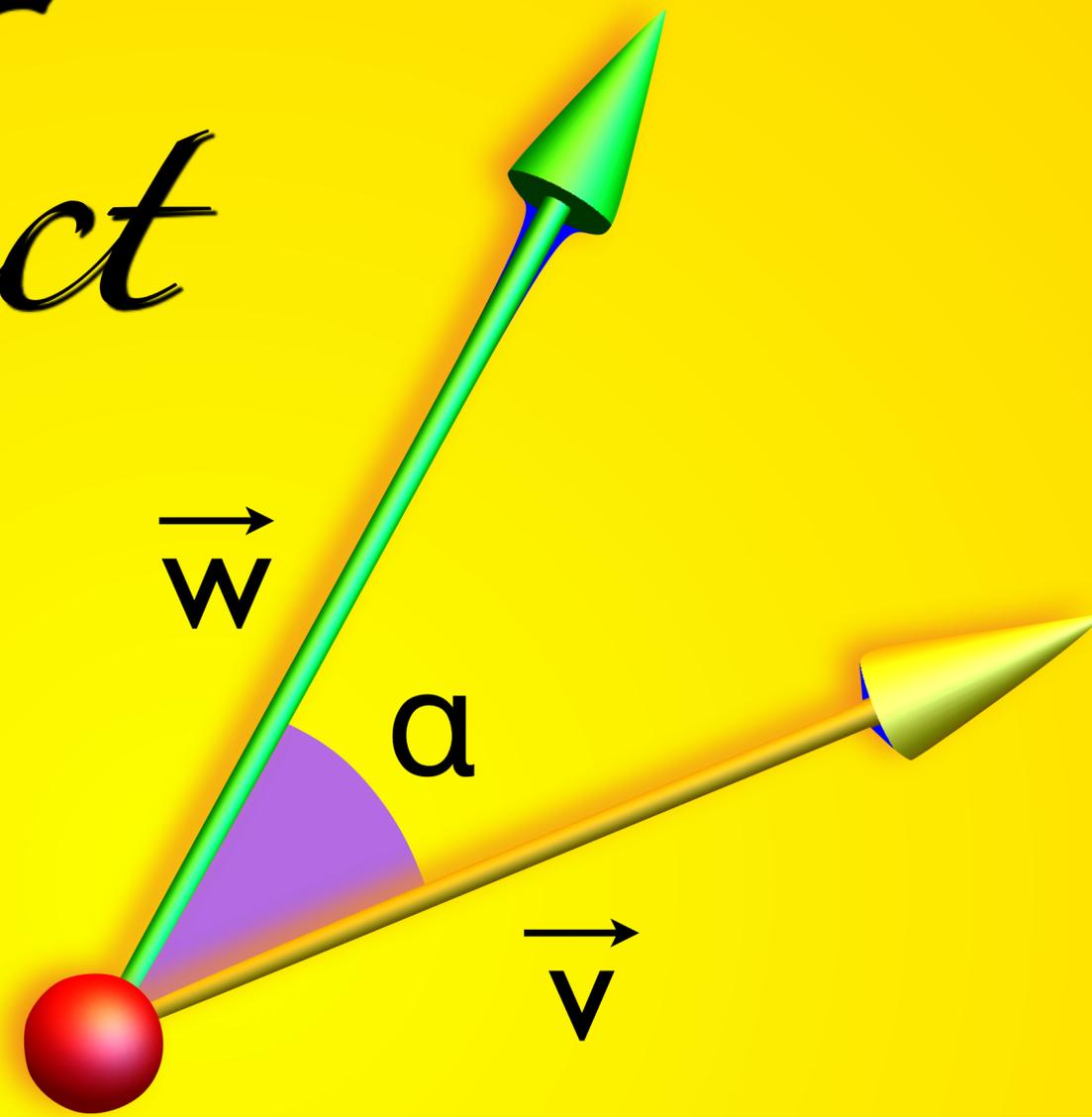
$$\|\vec{v} \times \vec{w}\|$$

Volume



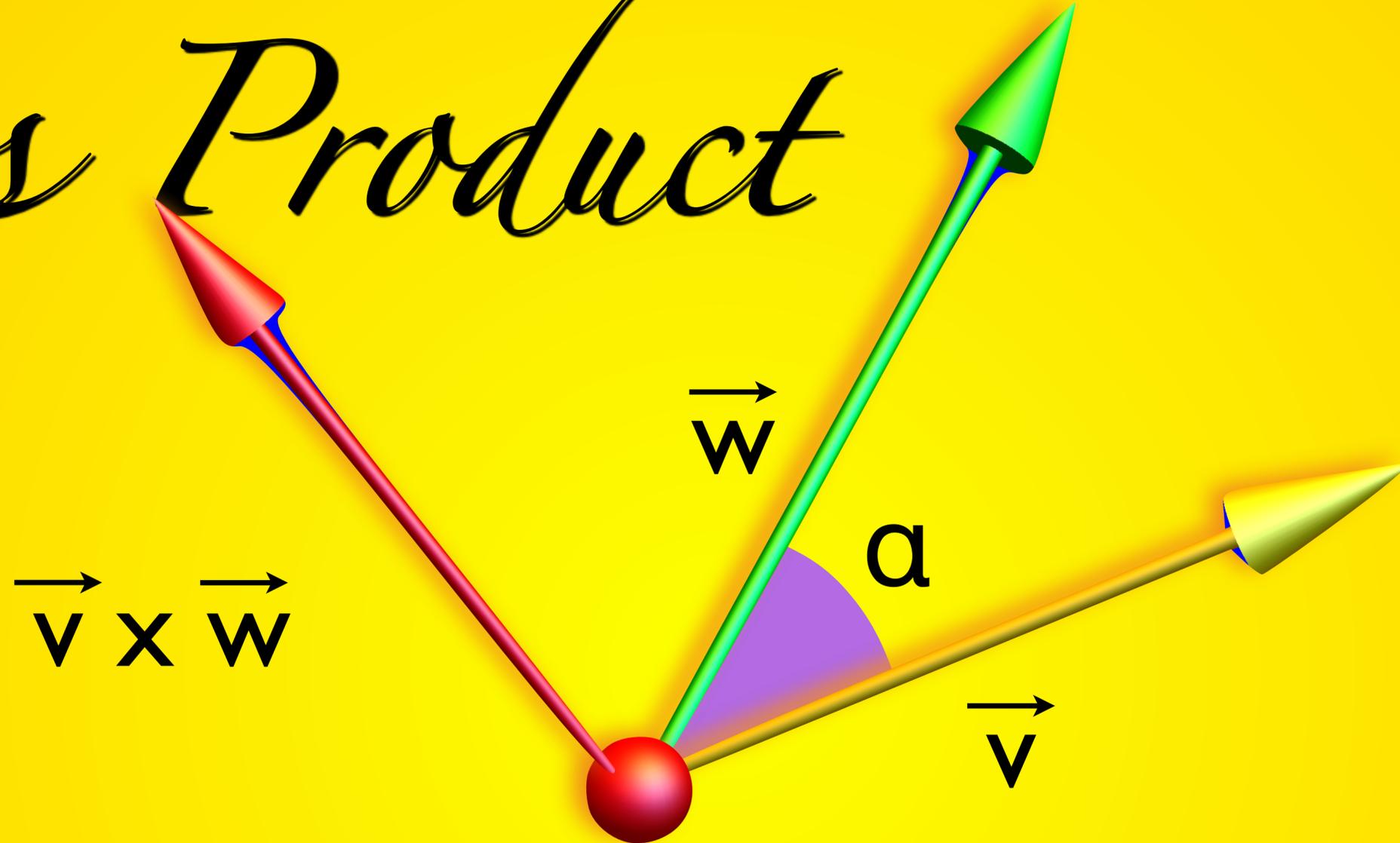
$$|\vec{u} \cdot (\vec{v} \times \vec{w})|$$

Dot Product



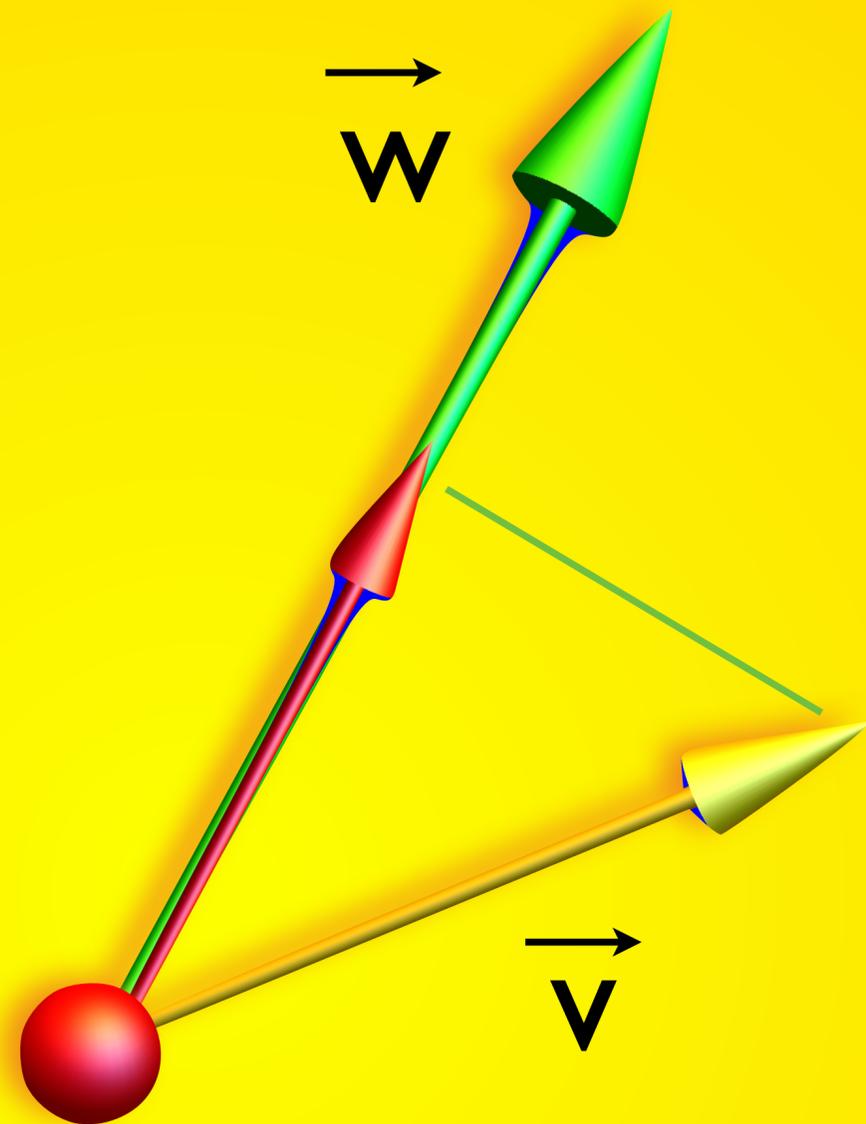
$$\vec{v} \cdot \vec{w} = |\vec{v}| |\vec{w}| \cos(\alpha) \quad \text{angle}$$

Cross Product



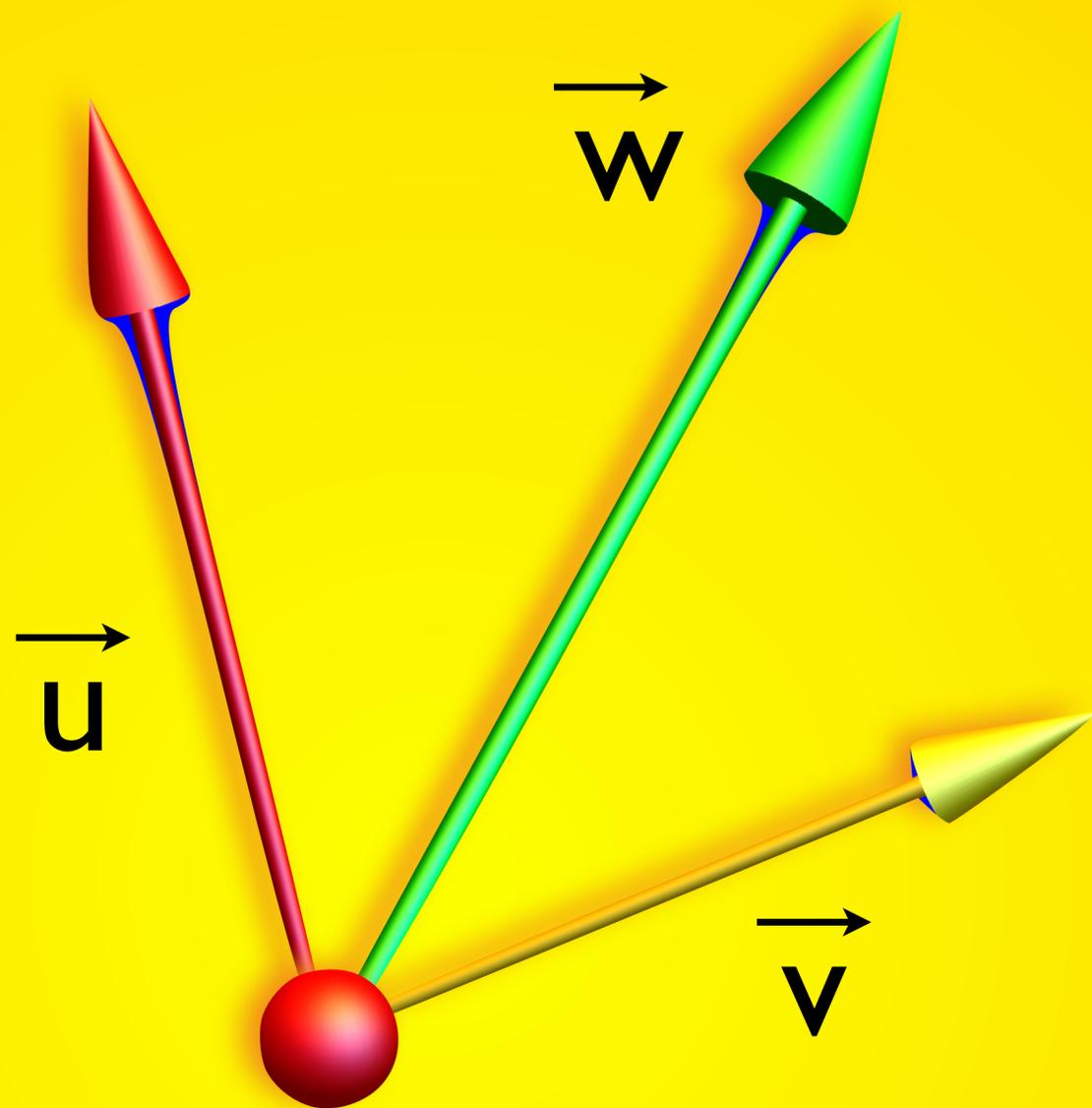
$$|\vec{v} \times \vec{w}| = |\vec{v}| |\vec{w}| \sin(\alpha) \quad \text{area}$$

Projection



$$= \frac{\vec{v} \cdot \vec{w}}{|\vec{w}|}$$

Volume



Area

$$\vec{u} \cdot (\vec{v} \times \vec{w})$$

$$|\vec{v} \times \vec{w}|$$

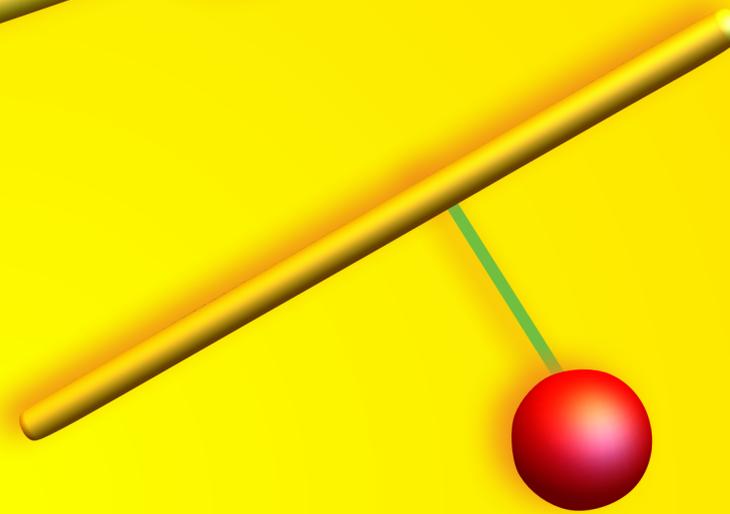
Problems

Distances

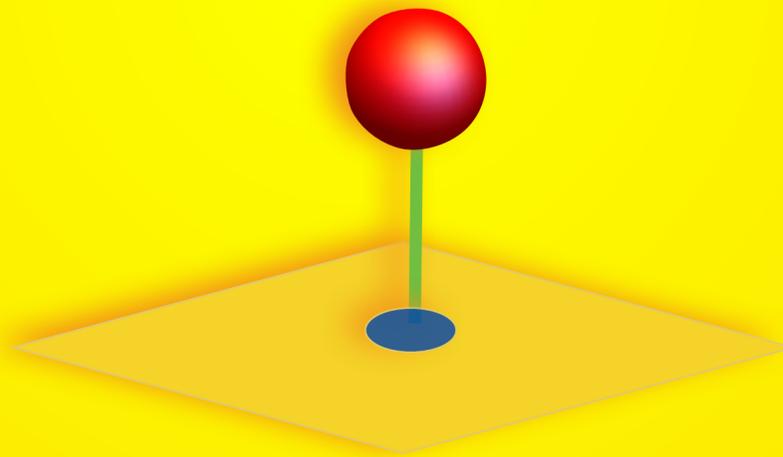
POINT POINT



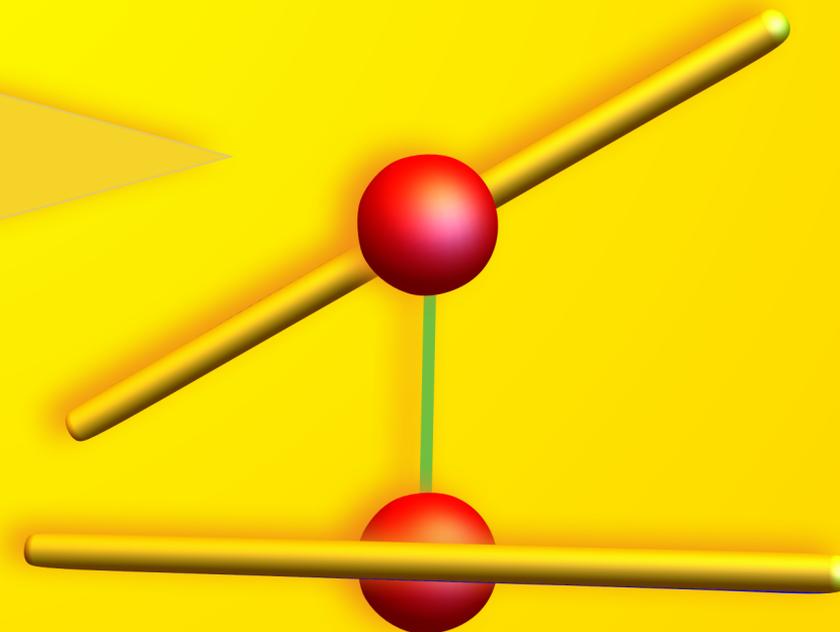
POINT LINE



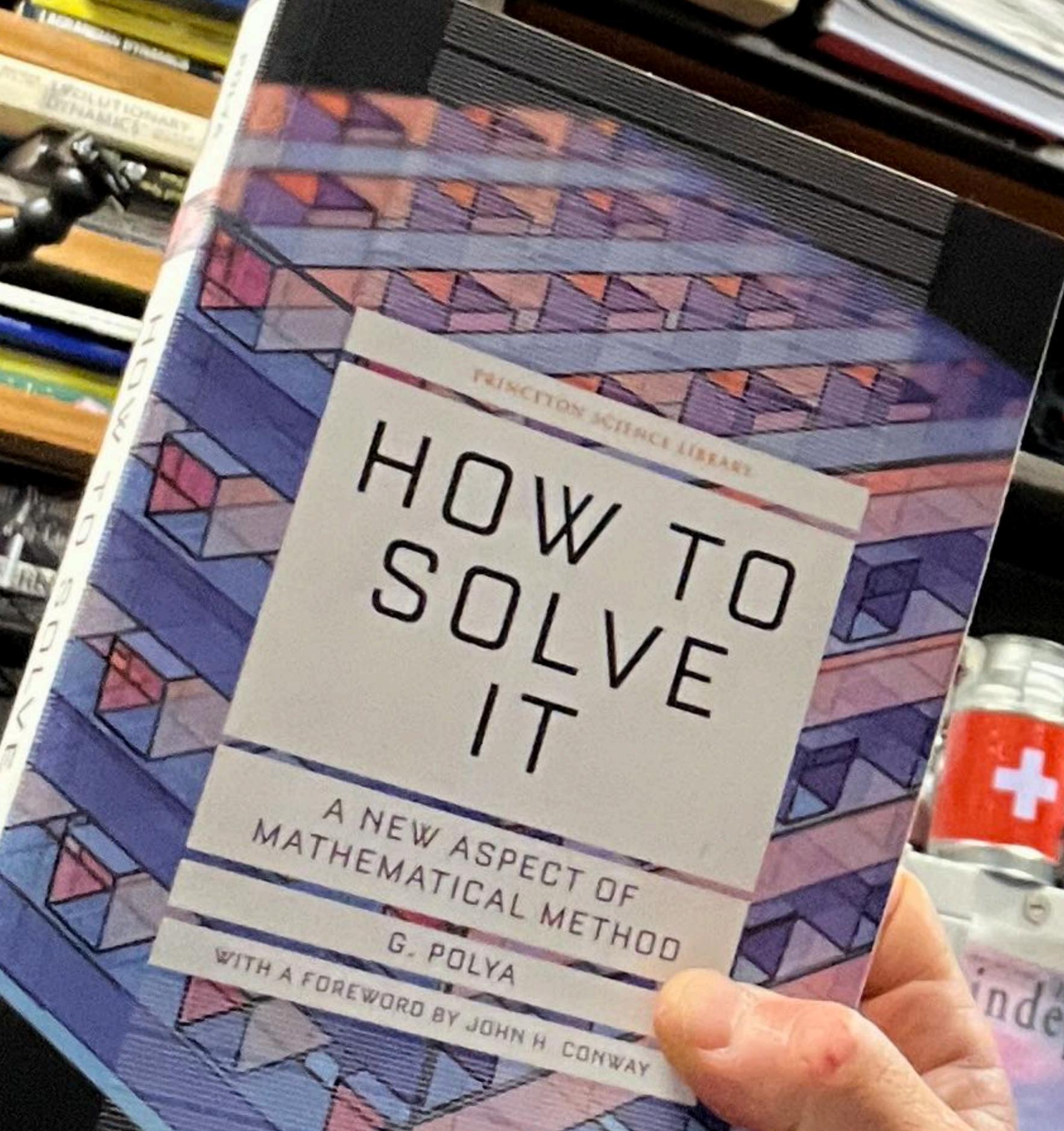
POINT PLANE



LINE LINE



Problem Solving



PRINCETON SCIENCE LIBRARY

HOW TO SOLVE IT

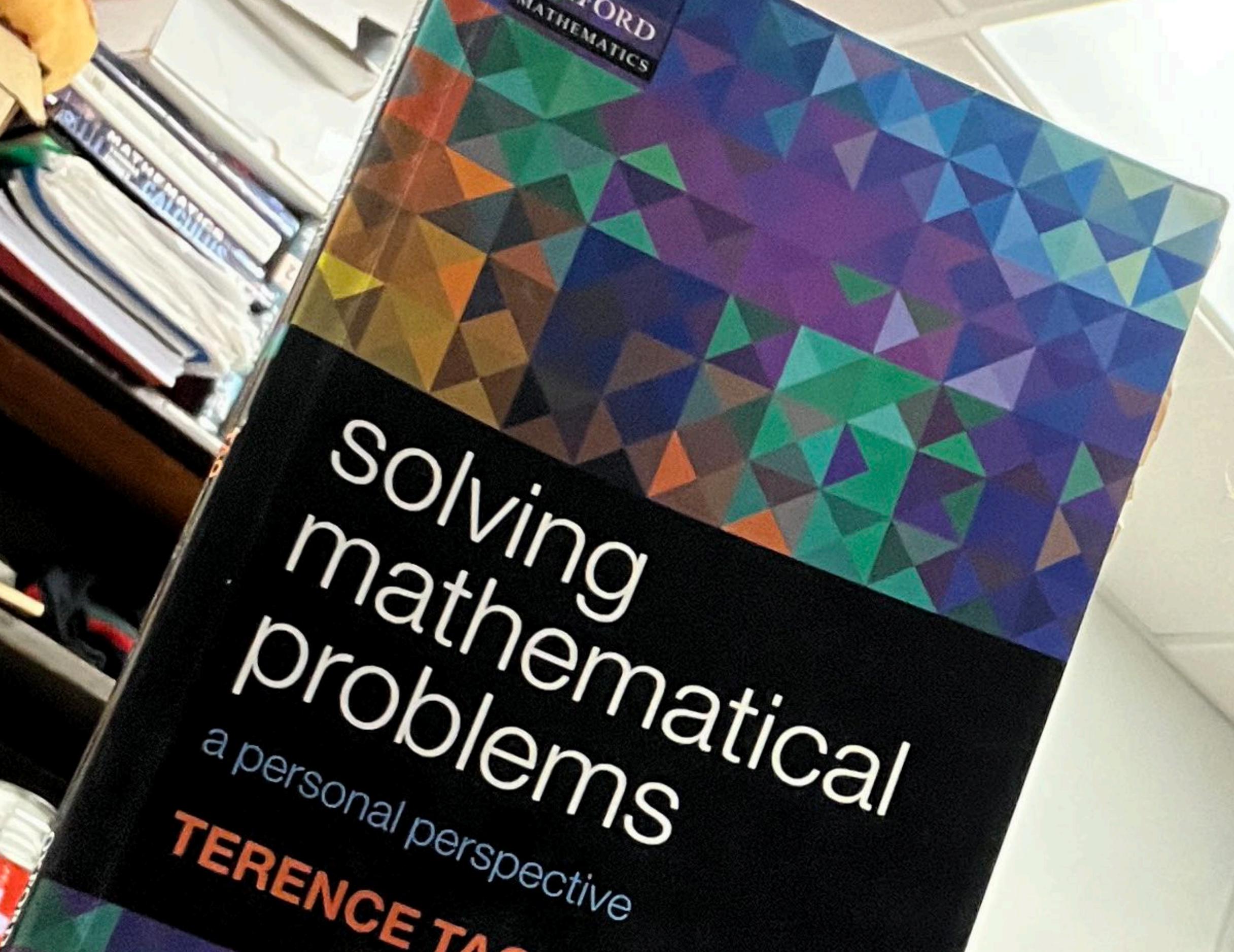
A NEW ASPECT OF
MATHEMATICAL METHOD

G. POLYA

WITH A FOREWORD BY JOHN H. CONWAY



independent



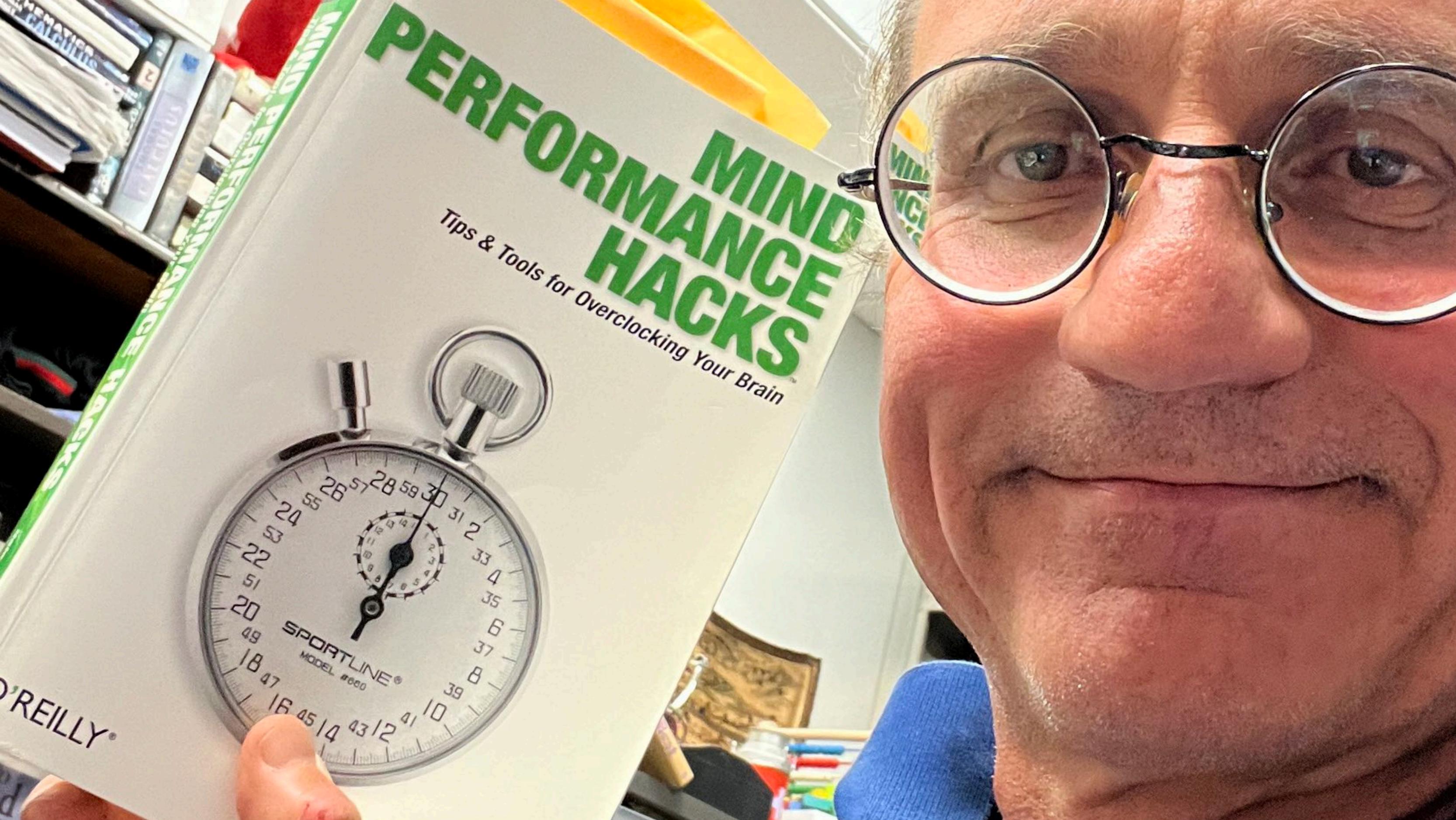
Solving Mathematical Problems

a personal perspective

TERENCE TAO

OXFORD
MATHEMATICS





MIND PERFORMANCE HACKS

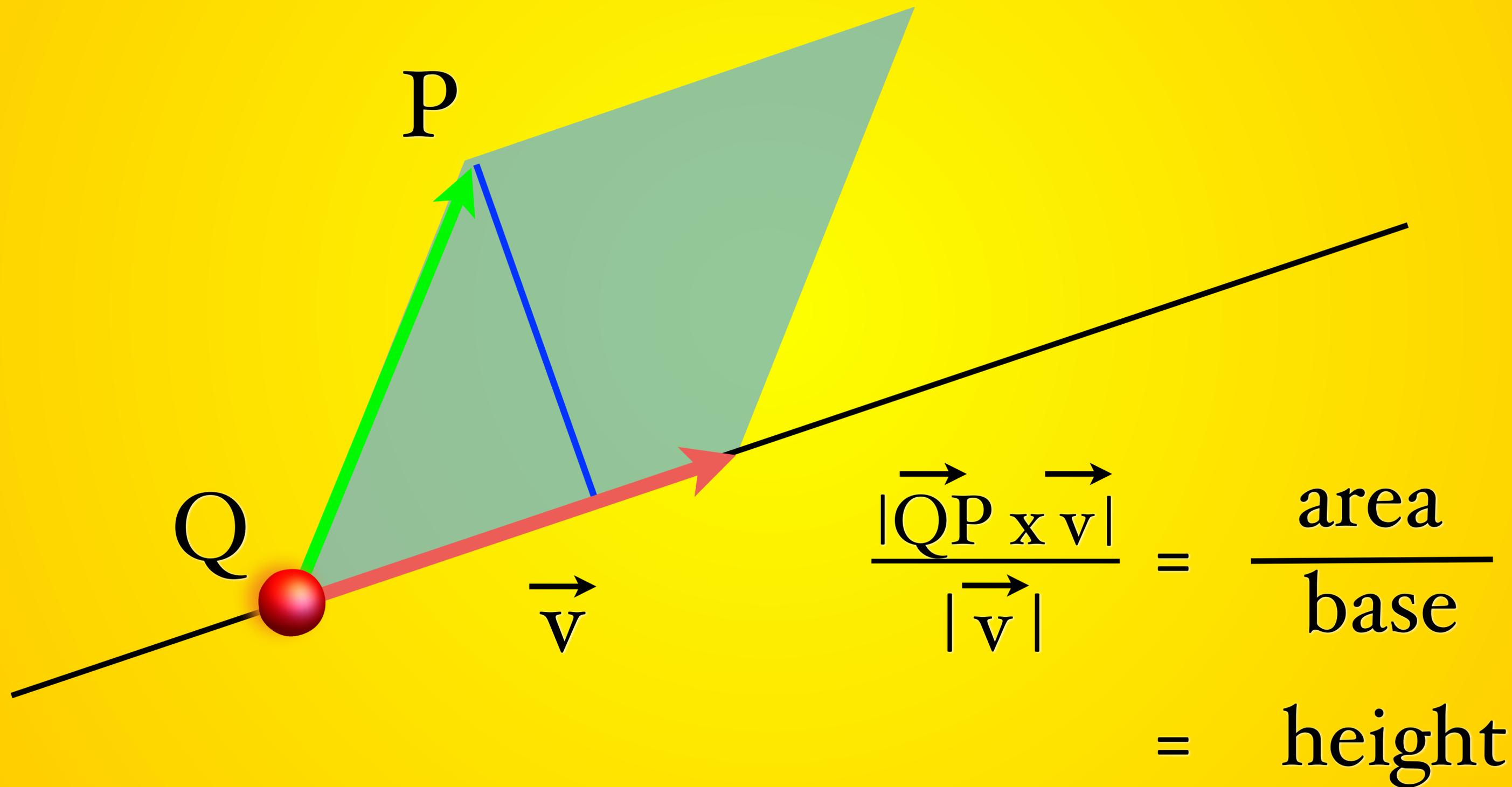
Tips & Tools for Overclocking Your Brain



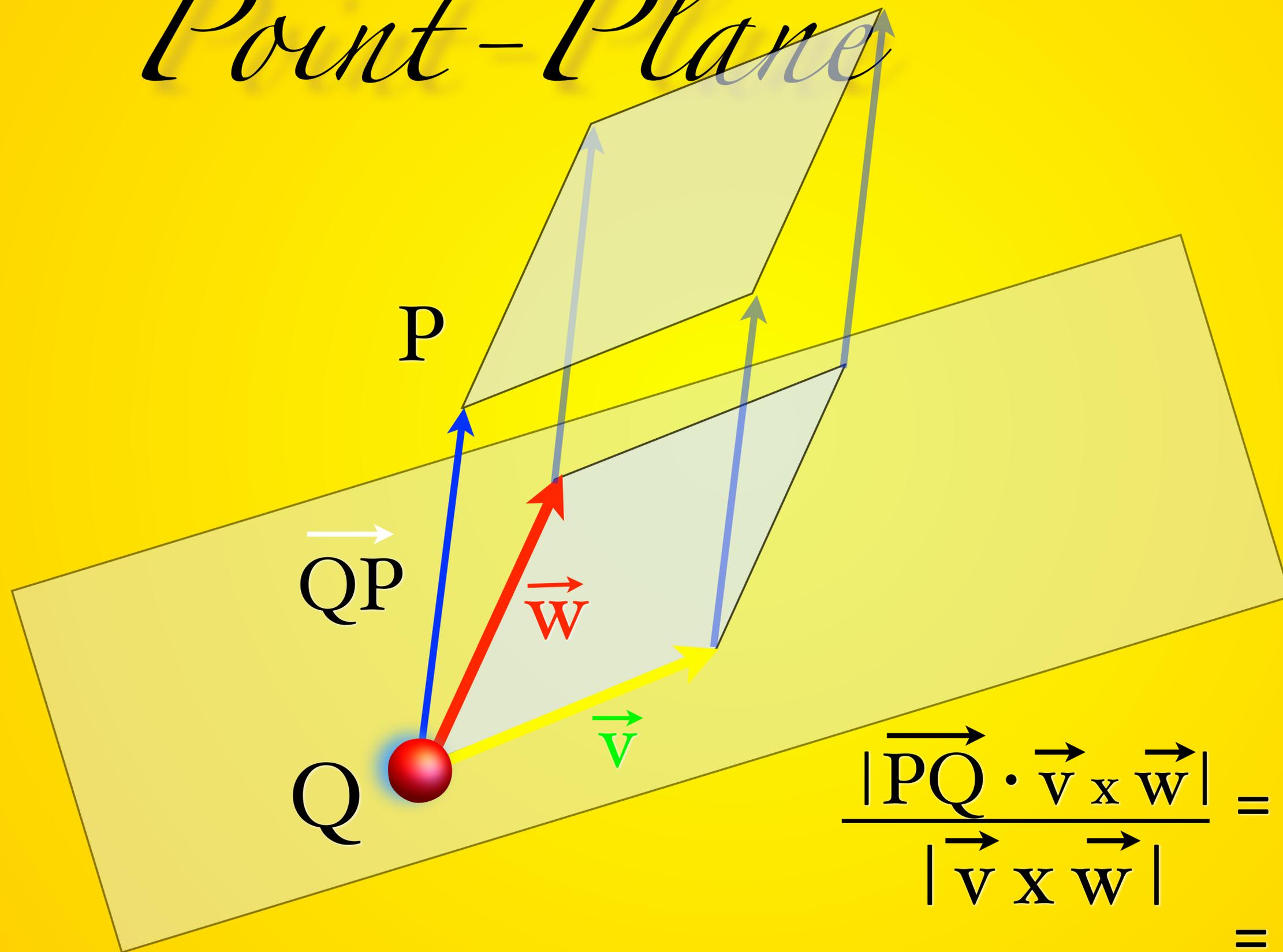
O'REILLY

Possible Solutions

Point Line

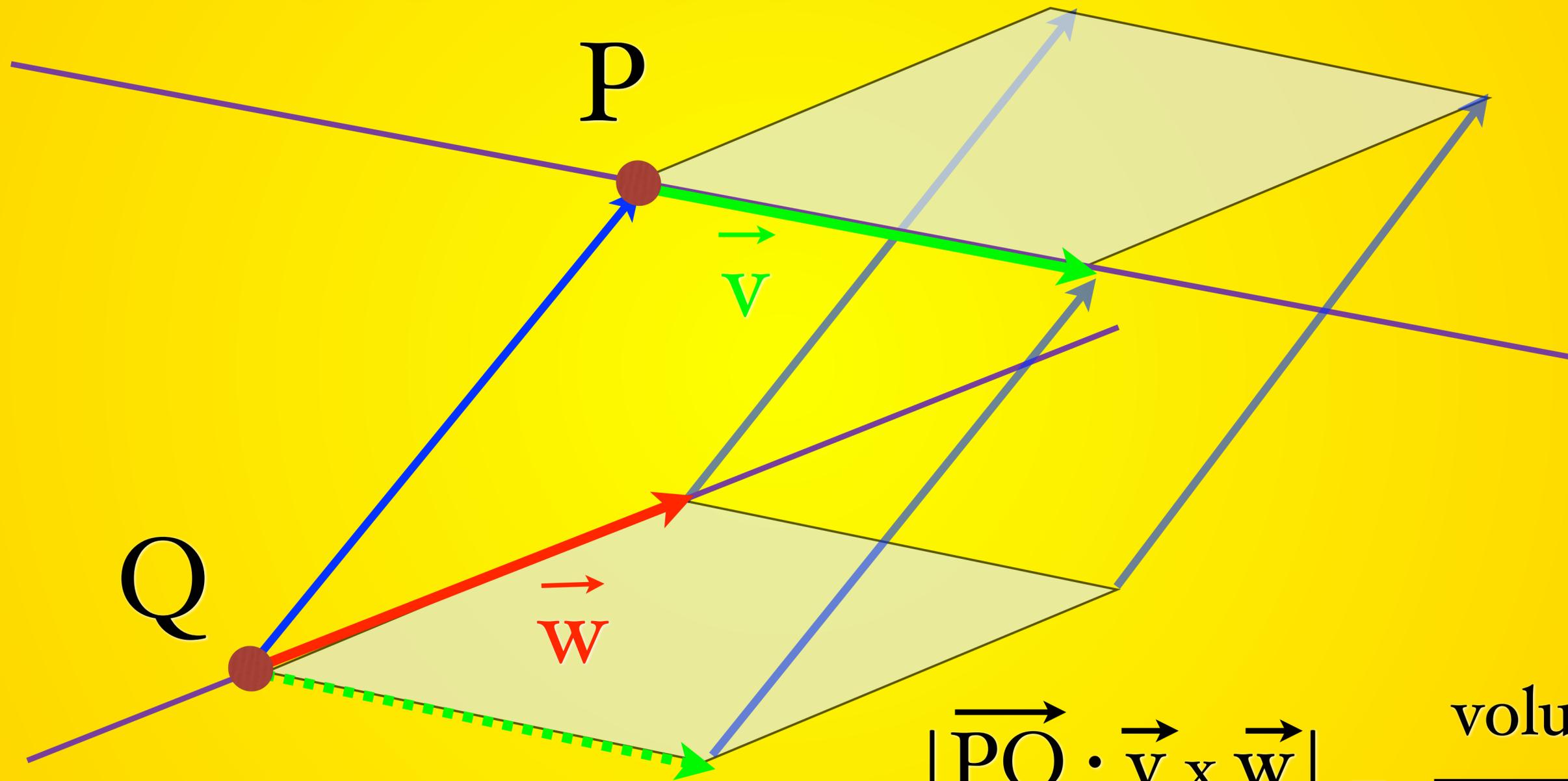


Point-Plane



$$\frac{|\vec{PQ} \cdot \vec{v} \times \vec{w}|}{|\vec{v} \times \vec{w}|} = \frac{\text{volume}}{\text{area}} = \text{height}$$

Line Line



$$\frac{|\vec{PQ} \cdot \vec{v} \times \vec{w}|}{|\vec{v} \times \vec{w}|} = \frac{\text{volume}}{\text{area}} = \text{height}$$

THE END