
Week 6



TAM 210/211 Introduction of Statics

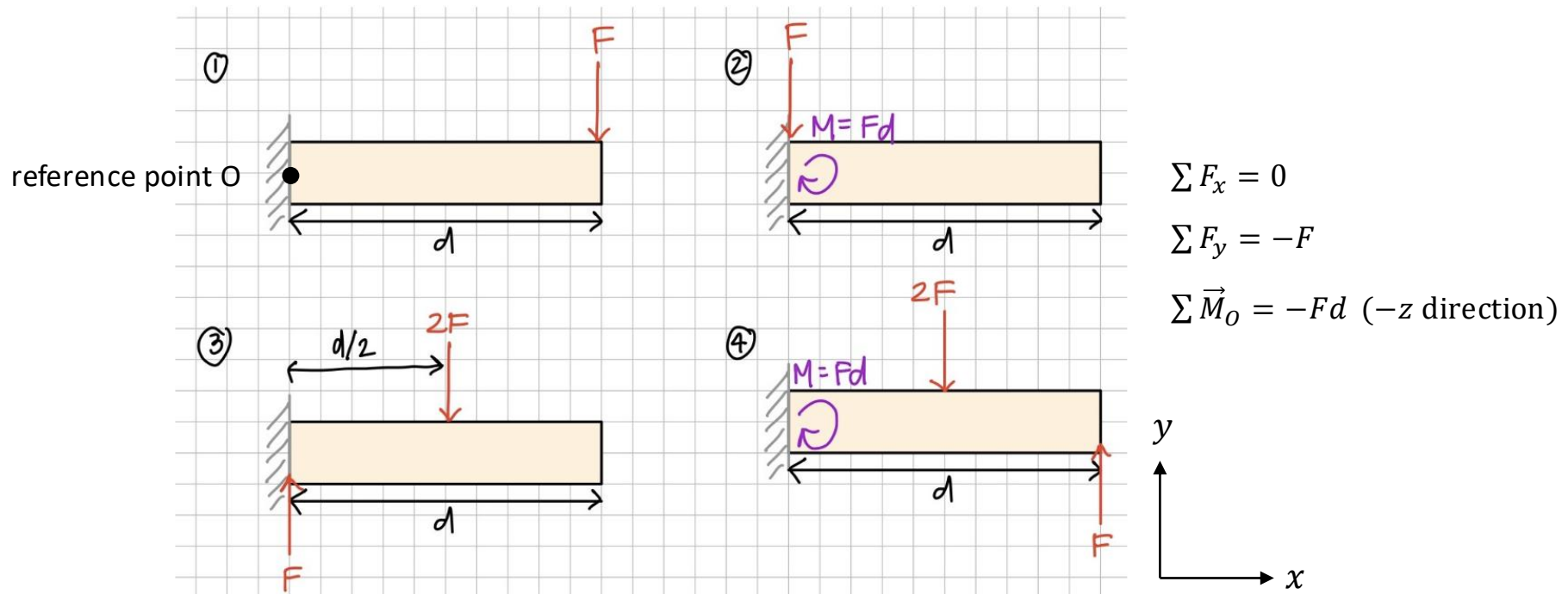
DISCUSSION SESSION



WEEK 6 – Equivalent Systems

- **Equivalent Systems**

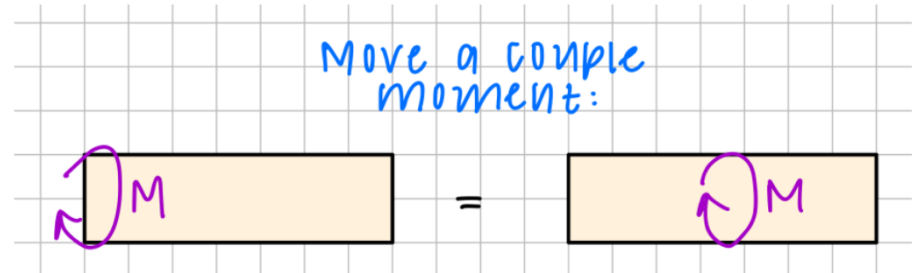
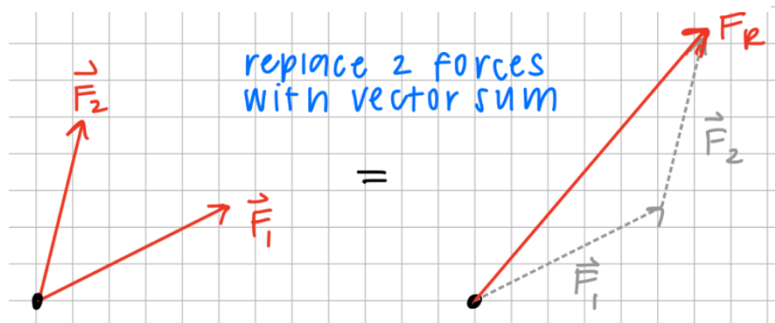
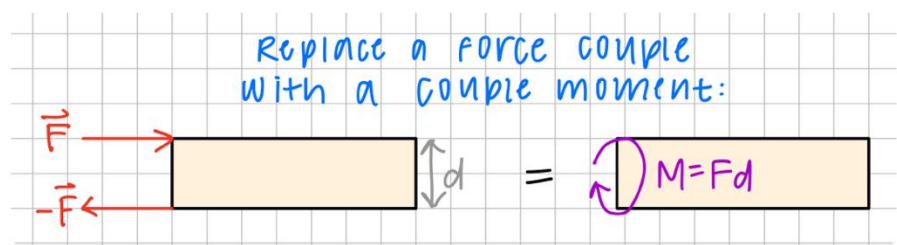
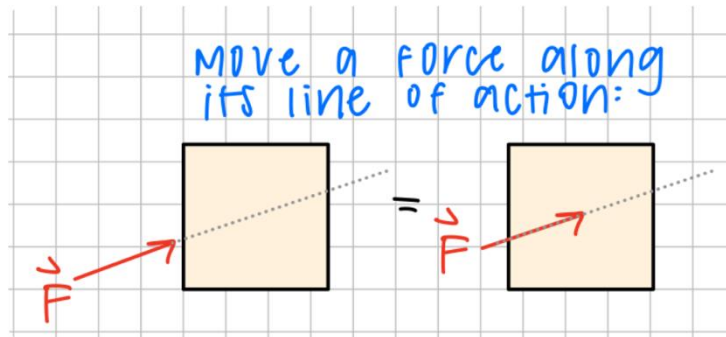
- The sum of external forces and sum of external moments are the same
- The same external effect (but the internal forces may be different)
- Simplify the force system using equivalent systems
- Move, combine, or decompose forces and moments



WEEK 6 – Equivalent Systems

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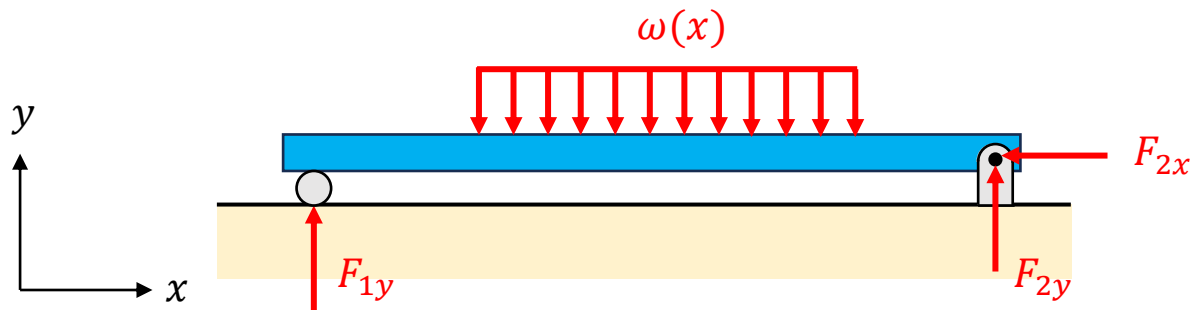


* couple moment = a free moment,
independent of the point of application

WEEK 6 – Equivalent System

- **Concentrated forces vs. distributed loads**

- Concentrated forces: forces acting on a specific point on a body
- Distributed loads $\omega(x)$: forces applied over a length, area, or volume
- Resultant force ($\vec{F}_R$) of distributed loads
 - Magnitude: area under the $\omega(x)$ curve
 - Point of application: centroid of the shape of the force curve
 - More information → reference pages of the course website:
https://www.mechref.org/sta/force_systems/?origin=coursemenu



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