

Sept 28, 2015

LB 273, Physics I

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**Today:**

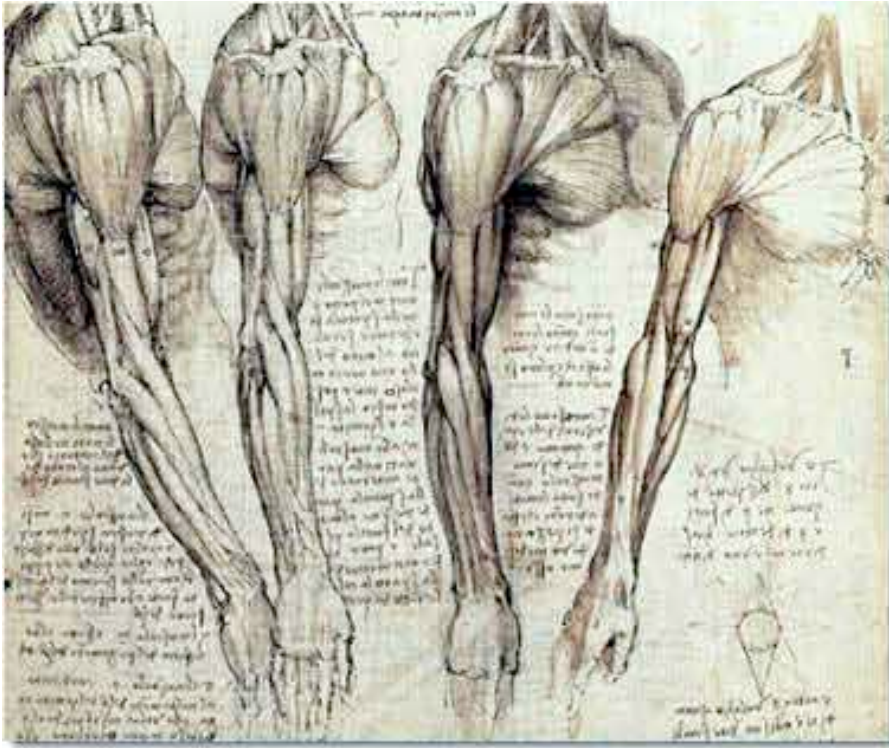
**Tension**

**Exam Info**

**Center of Mass**

*Irish Phrasebook*

***We're sucking diesel now*** – When things start coming together after you have been struggling with them for a while



Imagine a person holding a barbell in their hand, with the hand by their side. Nothing is moving. Draw the free-body diagrams for (1) the barbell, (2) the person's arm, and (3) their shoulder. Take into account the weight of the arm in your diagrams.

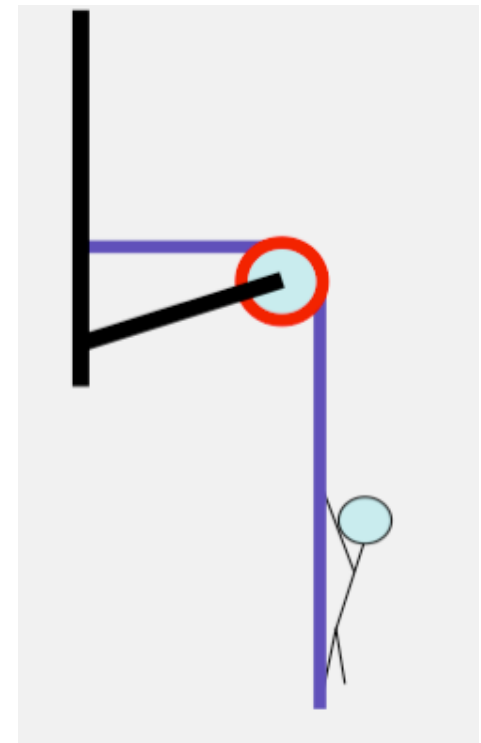
# Conceptual Ideas Underlying Tension

- Most solids support loads through compression (bones) or tension (muscles)
- Tension is basically a way to transmit force from one place to another



A climber with mass  $m_c$  hangs from a vertical massless rope. The rope goes over a pulley and, after traveling horizontally for a short distance, is attached to the wall. What is the tension on the rope,  $T_r$ ?

- A.  $T_r < m_c g$
- B.  $T_r = m_c g$
- C.  $T_r > m_c g$
- D. Not enough information given to answer the question



(note:  $g$  = accel. due to gravity)

# Announcements

- Ch 3.1-3.4 LON-CAPA homework due tonight
- Ch 3.1-3.4 on-paper homework due Friday Oct. 2<sup>nd</sup>
  - Bring attempts to **Part I** to class on Wednesday
- Reading question for Ch 4.4-4.6 Tuesday 6th
- Exam 1 on Monday 5<sup>th</sup>

# Exam 101 - Logistics

- 55 minutes long
- 6 questions (no multiple choice)
- Covers Chapters 1 - 3.4
- Questions from reading materials, topics discussed in lecture (including clicker questions), LON-CAPA homework, and on-paper homework.
- Exams will be graded and handed back to you the following week.

# Exam 101 - Logistics

- You should bring
  - Pencils
  - Eraser
  - Calculator
  - **ONE** 3"x5" index card with hand-written notes
- We will provide
  - Formula sheet (it's on LON-CAPA if you want to see it)
  - Scratch paper

# Exam 101 - Studying

- Formula sheet, review sheet, free response problem grading rubric, exam review guide, and old exams are all posted in “Exam prep materials” folder on LON-CAPA
- My suggestion; don’t spend lots of time on memorization – focus on **concepts** and creating the various **representations** (FBDs, setting up N2 equations, etc)
- Make use of the help room, faculty office hours, studying with fellow students
- Review session on **Wednesday, 9/80 at 7pm and Thursday, 10/1 in C104**



# Exam 101 – Correction Problem

- A way to correct one question on the exam! (any question that you **attempted** on the exam - including ones with multiple parts)
- PDF of exam will be posted to LON-CAPA right after the exam
- You need to provide a solution to your (entire!) problem of choice at the **beginning of lecture on Wednesday Oct. 7th**
- You get back **half the point difference** between the question score and the correction problem (Free points!)
- You'll get back the correction problem with your exam the following week - your exam score will include the points gained back.

In addition to the review sessions;  
I'll have additional office hours this  
week. When is the best time for me  
to add hours?



- A. Thursday morning 11am – 12:30pm
- B. Friday morning 9am – 10:30am
- C. Fri 2:30pm – 4pm
- D. None of these work for me

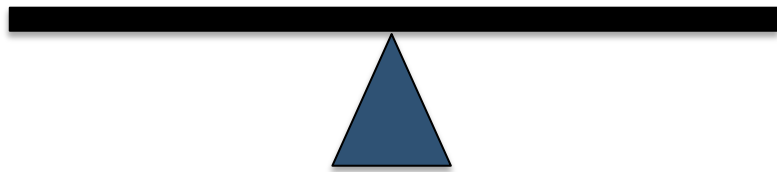
# Torque Reading Questions

I would like to address the equation that involves Torque and how to use it properly, the moment-arm concept is a little weird to me.

I do not understand the three diagrams on page 63 at all with the three lines in each.

I do not quite understand the book's explanation of what and how to determine the direction of torque. Can you go over this in class?

**Reading Q:** How do we determine the "point" object of an extended body?



The beam is stationary.  
What can we say about the beam and pivot system?  
What does that tell you about the mass of the beam?