To do ...

- HW 9 ME (extended) due Sat
- WA 5 due Sun
- HW 10 PL due Tues
- Quiz 3 sign up – DO IT!
Quiz 2 results

- Practice PL HW on your own
- Monitor your time
- Use matlab
- Read each question, write givens, unknowns, draw FBD

- Exam reflections
  - What did you do to prepare for the quiz?
  - What concepts did you struggle with?
  - What can you do differently to prepare for the next quiz?

Median: 75%
Perfect scores: 20%

Great Job 😊
Thank you for your comments!!

Distributed loads

Equivalent systems

Homework
PL ? ME

Quizzes

Daily office hours are held in MEB 335 on Mondays, and Grainger 429 on all other days according to the schedule below. Office hours start in Week 1 (Tuesday, August 23) of the semester.

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More examples
Less examples

My voice!!

OH YEAH!!
Two-force members

In the cases above, members AB can be considered as two-force members, provided that their weight is neglected.

- Any member with only two forces applied
- To be in equilibrium:
  \[ \sum F_x = 0 \]
  \[ \sum F_y = 0 \]
  \[ \sum M_o = 0 \]

- Line of action is the line connecting where the forces are applied.
- \( |F_A| = |F_B| \)
- \( F_A + F_B = 0 \)

To therefore, you know the direction of \( F_A \) and \( F_B \).
If the crane boom and truck have a mass of 18 Mg and 1.8 Mg at \( G_1 \) and \( G_2 \), respectively, determine the reactions at each of the four outriggers as a function of the boom angle when the boom is supporting a load having a mass of 1.2 Mg.

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**Idealized Model**

- Draw x-y axis and FBD.
- Sum forces and moments.
- Number of unknowns

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**Sum Forces:**

\[
\begin{align*}
\sum F_x & : \text{ none} \\
\sum F_y & : N_A + N_B - G_1 - G_2 - W = 0
\end{align*}
\]

---

**Sum Moments:**

\[
\sum M_B : (1)G_1 - 4N_A - (6\sin \theta - 2)G_2 - (12.25\sin \theta - 2)W = 0
\]

* 2 unknowns : 2 equations! OK!

\[
N = \frac{1}{4} \left( G_1 - (6\sin \theta - 2)G_2 - (12.25\sin \theta - 2)W \right)
\]
\[ N_A = \frac{1}{4} \left( G_1 + 2G_2 + 2w - (6G_2 + 12.25w) \sin \theta \right) \]

\[ N_A = 58860 - 62539 \sin \theta \]

Using \( \geq f \),

\[ N_B = G_1 + G_2 + W - N_A \]

\( N_A \) and \( N_B \) both depend on \( \theta \).

* USE MATLAB! \[ \times 10^3 \]

**Critical Angle for tipping**

Q: What does \( N_A < 0 \) mean?