Topics for Today

• Syllabus/Schedule
• Homework
  – Read Chapter 1, Go over Class 3 slides
  – Reading Quiz 9/11
• Paper
• Math
• Historical Overview

Web Access

• Powerpoint slides on web
• Blackboard
• Website
  http://www.sos.siena.edu/~mmccolgan/Structures/Home.html

Teaching Philosophy

• You learn best by doing
• You will be active learners!
  – Reading
  – Working problems
  – Discussing with neighbors
  – Teaching peers
  – activities
Group/Cooperative Learning
- Think – Pair – Share
- Group problems
- Group discussions
- Working together on homework is recommended
  - Discuss problems
  - Write your own solutions!!

Course Design & Grading
- Tests 30%
  - Exam 1 15%
  - Exam 2 15%
- Activities 25%
  - No make-up activities
  - On Thursdays, typically
- Other 25%
  - Reading Quizzes
  - Homework
  - Paper
  - In-class problems
- Final Exam 20%

Textbook
- Understanding Structures
  by Fuller Moore
  - Reading Quizzes

Notes
- Powerpoint slides will be posted to the web.
  - Not everything is in handouts or book!!
- You need paper for working out in-class problems
- Calculator!
- Binder is a good option
**Attendance Policy**

- Students are expected to attend all classes.
- Attendance will be taken each class.
- Unexcused absence will lower your final grade by one step (B to B-, for example)
- Typically, new material will be discussed on Tuesdays.
- Activities will be held on Thursdays.
- Students should understand that some material discussed in class is not covered in the textbook.
- Activities, reading quizzes, and in-class problems can not be made up.

**Paper**

- Select Topic
  - Due 10/18
  - No duplicate topics
- Draft due 11/6
- Returned with revisions 11/22
- Final paper due 12/4
- Five pages long, double spaced, with figures

**Think-Pair-Share**

\[
\frac{2}{5} \times \frac{5}{6} = ?
\]

\[10^3 = ?\]

\[10^{-3} = ?\]

**Algebra – one unknown**

\[
\frac{x}{6} = \frac{1}{3}
\]

\[3x = 6\]

\[\frac{3x}{3} = \frac{6}{3}\]

\[x = 2\]
Think – Pair – Share

2y - 1 = 4y + 5

y = ?

Algebra – two unknowns

• Look for term similarity
• Can we add or subtract one term?
  2x + 3y = 8
  12x - 3y = 6

• Add
  2x + 3y + 12x - 3y = 8 + 6
  14x = 14
  \[ \frac{14x}{14} = \frac{14}{14} \]
  x = 1

• Get x by itself on one side

Algebra – two unknowns – con’t

• Insert x into one of the original equations
  2x + 3y = 8
  2(1) + 3y = 8
  2 + 3y - 2 = 8 - 2
  3y = 6

• Get the y term alone by subtracting 2 from both sides
  3y = 6
  \[ \frac{3y}{3} = \frac{6}{3} \]
  y = 2

• Divide by 3 to get y alone

Think – Pair – Share

5x + 10y = 15
5x + 20y = 45
The interior angles of a triangle sum to 180°.

For a right triangle that has one angle of 90°, the sum of the other angles is 90°.

\[ \alpha + \beta = 180° \]

\[ a^2 + b^2 = c^2 \]

\[ \sin \alpha = \frac{\text{opposite side}}{\text{hypotenuse}} = \frac{AB}{CB} \]

\[ \cos \alpha = \frac{\text{adjacent side}}{\text{hypotenuse}} = \frac{CA}{CB} \]

\[ \tan \alpha = \frac{\text{opposite side}}{\text{adjacent side}} = \frac{AB}{AC} \]
x- and y- vector components

• x-component
  • $x = 5 \times \cos(30^\circ)$
  • $x = 4.33 \text{ m}$

• y-component
  • $y = 5 \times \sin(30^\circ)$
  • $y = 2.5$

Think – Pair - Share

• x-component
  • $x = ?$

• y-component
  • $y = ?$

Think-Pair-Share

• If $CB = 10$, and $CA = 0.5$
  • What is $\alpha$?
  • What is the length of $AB$?

New River Gorge Bridge, Fayetteville, West Virginia

Courtesy D.O.T. , West Virginia, Public Affairs, David Brown
Empire State Building