Mat 011 Agenda
Day 1: 9/4/02

Short Placement Test
Index Cards:
  Name
  Address
  Phone Number
  Email Address
  Why taking this course
  Something Unique about you
Attendance Roll Sheet
Class Policy Sheet
Assignments and Course Outline
Software/Video Guide
Web page: http://faculty.mc3.edu/rhofman/first.htm

Mat 011 Web page:
http://www.mc3.edu/crsprog/career/MATHSCI/mat011/mat011.htm
BlackBoard: http://blackboard.mc3.edu
Your username is: << first letter first name – full last name – last 4 digits of Datatel ID>>
Password is: <<Datatel ID>>
For Example:
Student Name: John Smith   Datatel ID: 1234567
ID: jsmith4567   Password: 1234567
Mathematics
  Natural Numbers
  Whole Numbers
  Equals, Not Equal, Less than, Greater than,
  opposite of, absolute value
  Signed Number Handout
  Rules for Addition and Subtraction of Signed
  numbers

Homework: Topics 1 and 2 pages S7, S8, S9
\{1, 2, 3, \ldots \} \text{ Counting nos or}\n\{0, 1, 2, 3, \ldots \} \text{ Natural nos}\n\{\ldots -3, -2, -1, 0, 1, 2, 3 \} \text{ Integers}\n\{\}$
Unit 1 Lecture 1
Signed Numbers

- Real Number System
- Symbols of equality, inequality, less than, greater than
  - Unary operations: opposite of; absolute value
- Rules of Addition and Subtraction for Signed numbers
  - Mathematical Statement into Symbols
Objectives

- To identify Real numbers
- To learn the rules for addition and subtraction of signed numbers
- To learn how to go from a mathematical statements to symbols and solve
Real Numbers

• Two subsets: Rationals and Irrationals
• Rationals contain Integers as a subset
• Integers contain Whole Numbers as a subset
• Whole numbers contain Counting Numbers or Natural Numbers as a subset.
Examples

• Counting Numbers or Natural Numbers
  \{1, 2, 3, \ldots\}

• Whole Numbers \{0, 1, 2, 3 \ldots\}

• Integers \{\ldots -3, -2, -1, 0, 1, 2, 3, \ldots\}

• Rational Numbers \{-8, -1.5, 7/4, 0, 6, etc.\}

• Irrational Numbers \{\pi, \sqrt{2}, -\sqrt{7}, etc.\}
Equals, Not Equal, Less than, Greater than

\[ 2 + 3 = 5 \]
\[ 2 \cdot 3 \neq 5 \]
\[ 2 \cdot 3 \text{ is greater than } 5 \]
\[ 6 > 5 \]
Opposite of, absolute value

opposite of 3

opposite of -3

- (-3)

6 - 4

-3 -2 -1 0 1 2 3 4 5 6
$|5| = 5$

$|-5| = 5$

$-5$
Mathematical Statements into Symbols

1. I have $60 and I owe you $90. What is my net worth?

\[ +60 - 90 = -30 \]
Mathematical Statements into Symbols

1. I have $60 and I owe you $90. What is my net worth?

\[ + 60 - 90 = -30 \]
2. I am in debt for $50 and you give me $10. What is my net worth?

\[-50 + 10 = -40\]
2. I am in debt for $50 and you give me $10. What is my net worth?

- 50 + 10 =
3. I am in debt for $30 and you give me $40. What is my net worth?

\[-30 + 40 = 10\]
3. I am in debt for $30 and you give me $40. What is my net worth?

\[-30 + 40 = \]
4. I am in debt for $20 and I owe you $50. What is my net worth?

\[-20 - 50 = -70\]
4. I am in debt for $20 and I owe you $50. What is my net worth?

- 20 - 50 =
\[ +5 + 3 = 8 \]
\[ +5 - 3 = +2 \]
\[ -5 + 3 = -2 \]
\[ -5 - 3 = -8 \]

**Like Signs**

\[ \text{Add the common sign} \]
Addition of Signed Numbers

- Like Signs:
  - Ignore the signs
  - Add
  - Take the common sign
Unlike Signs:
- Ignore the signs
- Subtract
- Look to see what the sign was of the larger unsigned number
- Take that sign
Addition of Signed Numbers

• Like Signs:
  – Ignore the signs
  – Add
  – Take the common sign

• Unlike Signs:
  – Ignore the signs
  – Subtract
  – Look to see what the sign was of the larger unsigned number
  – Take that sign
Examples

- Like Signs:
  
  \[ +5 + 3 = +8 \]
  
  \[ -5 - 3 = -8 \]
• Unlike Signs:

\[ +5 - 3 = +2 \]
\[ -5 + 3 = -2 \]
• Like Signs:
  
  \[ +5 + 3 = +8 \]

  \[ -5 - 3 = -8 \]

• Unlike Signs:
  
  \[ +5 - 3 = +2 \]

  \[ -5 + 3 = -2 \]
**Perform the operation:**

<table>
<thead>
<tr>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>$-7 + 5$</td>
<td></td>
</tr>
<tr>
<td>$6 - 10$</td>
<td></td>
</tr>
<tr>
<td>$2 - 11$</td>
<td></td>
</tr>
<tr>
<td>$-8 - 15$</td>
<td></td>
</tr>
<tr>
<td>$-6 + 10$</td>
<td></td>
</tr>
<tr>
<td>$\frac{1}{4} - \frac{5}{6}$</td>
<td></td>
</tr>
</tbody>
</table>
Subtraction Key

-key, binary key,

7th row, 5th column
Opposite Key

(-) key, unary operation

9th row, 4th column
Use of the calculator to evaluate $-8.6 + 11.4$

To add signed numbers use the opposite 
(-) key, 9th row, 4th column.

$-8.6 + 11.4$ is keyed in as 
(-), 8.6, +, 11.4, ENTER
Use the calculator to evaluate: \(-16.85 - 28.42\)

To add signed numbers use the opposite key \((-)\) and binary subtraction key \(-\)

\(-16.85 - 28.42\) is keyed in as \((-), 16.85, -, 28.42, \text{ENTER}\)