Honors Advanced Algebra – Mr. Kellner
Chapter 1 – Equations and Inequalities
Assignment Guide

1.1 – Expressions and Formulas
Target Goals: Use the order of operations to evaluate expressions
Use formulas
HW #1 pg 7 #4-6, 11-25 odd, 29-37 odd, 41, 43

1.2 – Properties of the Real Numbers
Target Goals: Classify real numbers
Simplify expressions
Use the properties of real numbers to evaluate expressions
HW #2 worksheet 1.2

1.3 – Solving Equations Quiz#1
Target Goals: Translate verbal expressions into algebraic expressions and equations, and vice versa
Solve equations using the properties of equality
Solve literal equations for the given variable
HW #3 pg 22 #7, 13-29 odd, 34, 39-51 odd, 54, 57, 58, 63 Quiz on 1.1 and 1.2

1.3 (continued) – Applications for Solving Equations
Target Goal: Solve application problems by defining the variable, setting up an equation, solving the equation, and answering the problem
HW #4 Worksheet 1.3B

1.4 – Solving Absolute Value Equations Quiz#2
Target Goals: Evaluate expressions involving absolute values
Solve equations using absolute value
HW #5 pg 30 #17, 21, 24-34, 36-41, 45, 58, 60, 61 Quiz on 1.3A and 1.3B

1.5 – Solving Inequalities
Target Goals: Solve and graph one-step inequalities. Express the solution set in interval notation
Solve and graph multi-step inequalities. Express the solution set in interval notation
HW #6 pg 37 #7, 13-39 odd, 45

1.6 – Solving Compound and Absolute Value Inequalities Quiz#3
Target Goals: Solve and graph compound inequalities. Express the solution set in interval notation
Solve and graph absolute value inequalities. Express the solution set in interval notation
HW #7 pg 45 #9, 10, 13, 15-21, 35, 37-39, 45, 47, 73 Quiz on 1.4 and 1.5

Chapter 1 Review
HW #8 PreTest

Tentative Chapter one Test Date: _______________________

The retake test must be taken by: _________________________

Don't let what you cannot do interfere with what you can do.
John Wooden
By the end of this chapter, you should be able to...

- Use the order of operations to evaluate expressions. (1.1)
  _____ got it  _____ needs work  _____ no clue  problems 1 and 2

- Use formulas. (1.1)
  _____ got it  _____ needs work  _____ no clue  problem 4

- Classify real numbers. (1.2)
  _____ got it  _____ needs work  _____ no clue  problem 5

- Simplify expressions. (1.2)
  _____ got it  _____ needs work  _____ no clue  problem 3

- Identify properties of real numbers. (1.2)
  _____ got it  _____ needs work  _____ no clue  problem 6

- Translate verbal expressions into algebraic expressions and equations, and vice versa. (1.3)
  _____ got it  _____ needs work  _____ no clue  *problems 19-21

- Solve equations using the properties of equality. (1.3)
  _____ got it  _____ needs work  _____ no clue  problems 7, 8, 9

- Solve literal equations for the given variable. (1.3)
  _____ got it  _____ needs work  _____ no clue  problem 10

- Solve application problems by defining the variable, setting up an equation, solving the equation, and answering the problem. (1.3b)
  _____ got it  _____ needs work  _____ no clue  *problems 19-21

- Evaluate expressions and solve equations involving absolute values. (1.4)
  _____ got it  _____ needs work  _____ no clue  problems 11, 12

- Solve and graph inequalities. Express the solution set in interval notation. (1.5)
  _____ got it  _____ needs work  _____ no clue  problems 13, 14

- Solve & graph compound & absolute value inequalities. Express solution in interval notation. (1.6)
  _____ got it  _____ needs work  _____ no clue  problems 15-18
Target Goals: Use the order of operations to evaluate expressions
Use formulas

Simplify

1. \(4(6 + 2) - 81 \div 9 \cdot 3\)

2. \(\frac{3^2 - 4}{12 - 1 - 1}\)
If you choose to use a calculator, please do so carefully! Consider the following examples:

3. \[
\frac{5(3) + 3(-2)}{3(7)}
\]

4. \((-5)^2\) vs. \(-5^2\)

We can evaluate expressions by hand or on the calculator. Consider using the “STO” button on the calculator. If you do not know how to use the STO button please see me ASAP.

Evaluate each of the following if \(a = -2, b = 9, w = 5\) and \(x = \frac{2}{3}\).

5. \[
\frac{a^2 - bx}{wa^2}
\]
Target Goals: Classify real numbers
Simplify expressions
Use the properties of real numbers to evaluate expressions

Classify:

<table>
<thead>
<tr>
<th></th>
<th>Real</th>
<th>Irrational</th>
<th>Rational</th>
<th>Integer</th>
<th>Whole</th>
<th>Natural</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\frac{7}{2}$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\sqrt{5}$</td>
<td></td>
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<td></td>
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<tr>
<td>$\frac{24}{6}$</td>
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<td></td>
<td></td>
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<tr>
<td>1.8</td>
<td></td>
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<td></td>
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<tr>
<td>0.101101110</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>$\sqrt{169}$</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>$\pi$</td>
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</tr>
</tbody>
</table>
Write the letter of the correct property for each statement.

1. \(6a + 1 = 1 + 6a\)
   - A. commutative property of addition
   - B. commutative property of multiplication
   - C. associative property of addition
   - D. associative property of multiplication
   - E. identity property of addition
   - F. identity property of multiplication
   - G. inverse property of addition
   - H. inverse property of multiplication
   - I. distributive property

Simplifying Expressions

To simplify, we must get rid of all parenthesis and combine any like terms (terms that contain the same variables raised to the same power)

Combine like terms in the table. If not possible write “done”

<table>
<thead>
<tr>
<th>Expression 1</th>
<th>Expression 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>(2x + 3x =)</td>
<td>(2x + 3y =)</td>
</tr>
<tr>
<td>(2x^2 + 3x^2 =)</td>
<td>(2xy + 3xy =)</td>
</tr>
<tr>
<td>(2x + 3x^2 =)</td>
<td>(2x^2 y + 3x^2 y =)</td>
</tr>
</tbody>
</table>

Simplify each expression.

10. \(\frac{2}{3}(4x + 3y) + \frac{1}{4}(6x + 2y)\)
11. \(5c(\frac{2}{3}c) - 4c(c + \frac{1}{5})\)

HW: worksheet 1.2
Target Goals: Solve equations using the properties of equality
Solve literal equations for the given variable

EXAMPLES – Solve each equation, then check each answer.

To SOLVE means to ______________________________________________________

To CHECK an answer, ___________________________________. *Use “STO” if necessary!

If variables CANCEL and the remaining statement is true, write ___________. If false, write ________.

Solve each equation.
1. $5(3x + 5) = 4x - 8$
2. $2(x - 3) = 5x - 6 - 3x$
Hint: Multiply each term by the ________ to cancel fraction(s) or by a multiple of _____ to cancel decimal(s).

Solve each equation.

3. \(7.5n + 2.7 = 3.4n + 19.92\)

4. \(\frac{5}{6}w + \frac{3}{8} = \frac{2}{3}\)

**LITERAL EQUATIONS** - Use the properties of equality to solve for a specified variable.

5. Solve \(V = \frac{1}{3}\pi r^2h\) for \(r\)

Assignment #3 pg 22 #7, 13-29 odd, 34, 39-51 odd, 54, 57, 58, 63

Quiz #1
Target Goals: Solve application problems by defining the variable, setting up an equation, solving the equation, and answering the problem

Problem-Solving Plan: 1. Read the problem carefully.  
2. Choose one variable based upon the question being asked. 
3. Use this variable to write expressions for other quantities. 
4. Set up and solve an equation. 
5. Check that the answer(s) make sense.

Ex 1. Alan bought 5 pounds of peanuts for $2.50 per pound. He also bought cashews for $6.00 per pound. If Alan spent $30.50, how many pounds of cashews did he buy?

Ex 2. The lengths of the sides of a triangle are consecutive odd integers. The perimeter is 27 meters. What are the lengths of the sides?

Ex 3. Sonia is 3 years older than Melissa. The sum of their ages in 4 years will be 59 years. How old is Sonia now?

Assignment #4: Worksheet 1.3B
Evaluate each expression if $x = -8$ and $y = 5$.

1. $|x| - |y|$

2. $|2y - 7| + |3x + 11|$
Absolute value is ______________________________. The expression inside the absolute value bars can either be positive or negative. Therefore open sentences involving absolute values must be interpreted carefully. Always solve to isolate the \( |\text{absolute value}| \) then rewrite, without any \textit{absolute value} symbols, into \textit{two statements}.

\[ |x| = n \quad \text{must be rewritten as follows:} \]

All solutions \textbf{must be checked} when solving an absolute value equation due to potential extraneous solutions! Remember to always isolate the absolute value before writing the compound sentence!

Solve each equation. Check your solutions.

3. \[ 5|3x + 2| - 21 = -6 \]

4. \[ -2|3x + 4| = 8x - 16 \]

Assignment #5      pg 30 #17, 21, 24-34, 36-41, 45, 58, 60, 61

Quiz #2
**Target Goals:** Solve and graph one-step inequalities. Express the solution set in interval notation
Solve and graph multi-step inequalities. Express the solution set in interval notation

**Inequalities**

<table>
<thead>
<tr>
<th>Intervals</th>
<th>Interval Notation</th>
<th>Set Notation</th>
<th>Graph</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Bounded Open Interval</td>
<td>$(a, b)$</td>
<td>${x : a &lt; x &lt; b}$</td>
<td></td>
</tr>
<tr>
<td>2. Bounded Closed Interval</td>
<td>$[a, b]$</td>
<td>${x : a \leq x \leq b}$</td>
<td></td>
</tr>
<tr>
<td>3. Bounded Half-Open Interval</td>
<td>$[a, b)$</td>
<td>${x : a \leq x &lt; b}$</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$(a, b]$</td>
<td>${x : a &lt; x \leq b}$</td>
<td></td>
</tr>
<tr>
<td>4. Unbounded Open Interval</td>
<td>$(-\infty, b)$</td>
<td>${x : x &lt; b}$</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$(a, \infty)$</td>
<td>${x : x &gt; a}$</td>
<td></td>
</tr>
<tr>
<td>5. Unbounded Closed Interval</td>
<td>$(-\infty, b]$</td>
<td>${x : x \leq b}$</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$[a, \infty)$</td>
<td>${x : x \geq a}$</td>
<td></td>
</tr>
<tr>
<td>6. Entire Real Line</td>
<td>$(-\infty, \infty)$</td>
<td>${x : x \in \mathbb{R}}$</td>
<td>${x : -\infty &lt; x &lt; \infty}$</td>
</tr>
</tbody>
</table>

We will use both set-builder and interval notation on these notes (split the homework to use both also).

***Rule:*** When we multiply or divide both sides by a ____________, we must ______ the inequality!
Solve each inequality. Then graph the solution.

1. \(2x - 9 > 4x + 8\)

2. \(-x \geq \frac{x - 4}{7}\)

3. A number decreased by 6 is no more than 11.

Again remember:
If variables cancel out and the statement is true your solution set is “All Real Numbers”
If variables cancel out and the statement is false your solution set is “No Solution”

Assignment #6 pg 37 #7, 13-39 odd, 45
Target Goals: Solve and graph compound inequalities. Express the solution set in interval notation. Solve and graph absolute value inequalities. Express the solution set in interval notation.

**Compound Inequalities** - Two or more inequalities, when considered together, form a compound inequality.

<table>
<thead>
<tr>
<th>Containing “and”</th>
<th>Both inequalities are true at the same time.</th>
<th>The graph is the intersection of the graphs of the two inequalities. (Where the graphs overlap).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Containing “or”</td>
<td>Either of the inequalities are true, or both of the inequalities are true.</td>
<td>The graph is the union of the graphs of the two inequalities. (Where either of the graphs exist).</td>
</tr>
</tbody>
</table>

Graph the solution sets. Write the solution in set-builder and interval notation.

Ex 1) \(-2 \leq x + 3 < 4\)  
Ex 2) \(3t < -6\) or \(-12 < 11t - 1\)

The graphs of most “and” problems look like example 1 and the graphs of most “or” problems look like example 2. Occasionally we encounter “special cases”…

Ex 3) \(2y > y - 3\) or \(y < 6\)  
Ex 4) \(x - 4 < -1\) or \(x \leq 1\)  
Ex 5) \(y - 1 < 2y + 2 < y + 7\)
**Absolute Value Inequalities** – Treat all inequalities as equations (with = signs) in your compound sentence as in section 1.4. Then test 3 critical points and shade where the statement is true.

**EXAMPLES:** Solve each open sentence absolute value and graph each solution set.

Ex 6) \(|x - 3| - 10 \leq -3\) \hspace{1cm} Ex 7) \(2|4x - 5| > 6\)

Ex 8) Consider the following special cases:

a. \(|4x| = -16\) (review) \hspace{1cm} b. \(|4x| < -16\) \hspace{1cm} c. \(|4x| > -16\) \hspace{1cm} d. \(|x| > 0\)

**Assignment #7** pg 45 #9, 10, 13, 15-21, 35, 37-39, 45, 47, 73

**Quiz #3**