Harold's Word Problems
"Cheat Sheet"

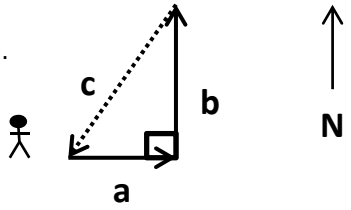
6 February 2014

Harold's Modified GUESS Method for Solving Word Problems:

1. Diagram
2. **G**ivens
3. Observations
4. **U**nknowns
5. **E**quations
6. **S**olve
7. **S**ubstitute
8. Double Check

Example:
A marching band player marches 10 yards East then 40 feet North on a football field. What is the shortest distance he/she must march to return to where he/she started?

1. Draw a simple **diagram** of the problem. Label everything.



2. Write down the **givens**. What information did they provide? Is any of it extraneous?
   a. a = 10 yards East
   b. b = 40 feet North

3. Calculate **observations** or easily derived information such as unit conversions.
   a. $10 \text{ yards} \times \left(\frac{3 \text{ feet}}{1 \text{ yard}}\right) = 30 \text{ feet}$

4. Write down the **unknowns**. What are they asking for?
   a. Shortest distance is a straight line, or 'c'
   b. c = ____?____ <units>

5. Recall relevant **equations** and formulas:
   a. Since the path marched is a right triangle we can use the Pythagorean Theorem: $a^2 + b^2 = c^2$

6. **Solve** symbolically
   a. $a^2 + b^2 = c^2$
   b. $c = \sqrt{c^2} = \sqrt{a^2 + b^2}$

7. **Substitute** the givens into the formula and reduce down to the simplest form. Don't forget the units.
   a. a = 30 feet
   b. b = 40 feet
   c. $c = \sqrt{(30 \text{ feet})^2 + (40 \text{ feet})^2} = 50 \text{ feet}$

8. **Double check** your work. Ask yourself if the answer makes sense. Box in your answer.

The shortest distance he/she must march is 50 feet.

NOTE: My method is an extension to the popular GUESS method taught in many high schools.

