1. On page 1 you discovered a rule for predicting how high an object will be lifted when using a single movable pulley: "**The object's lifting distance is ___ times the hand's lifting distance**."
   If your rule is similar, fill in the blank. If your rule is very different, then copy it here.

2. In the data table at the right the symbol "Y" represents the object lifting distance and "H" represents the *hand's* lifting distance. Use #1 to fill in the blanks.

DATA TABLE FOR #2

H (in m.)	Y (in m.)
0.20	
0.80	
	0.60
	1.00

3. Use that set of data to make a graph showing how Y depends upon H:
   a. The title of the graph ("**Y versus H**") should be written at the top.
   b. The *first* variable mentioned in that title should be copied onto the *vertical* axis of the graph. Appropriate units must be written in parentheses beneath it, as in the data table. (The first name in the title is called the "**dependent variable**".)
   c. The *last* name in the title is called the "**controlled variable**" because *YOU* control its value. Its name and units should be copied onto the *horizontal* axis of the graph.
   d. Choose appropriate **scales** by writing some evenly-spaced numbers along each axis, starting with 0 at the origin. Those numbers must cover the full range of the data, but it is *NOT* necessary for the spacing along the Y-axis to be the same as along the H-axis.
   e. Plot the points listed in the data table.
   f. If the pattern appears to be linear then use a ruler to draw a straight line. If the pattern appears to be linear but the data points do not lie exactly on the line because of random experimental error then we always draw two reasonable lines with different slopes, intersecting somewhere on the graph.

4. If there is a linear relationship between two variables and the graph describing that relation goes through the origin, the relationship between them is called a "**direct proportion**".
   a. We can *conclude* from the graph in #3 that **Y is directly proportional to ___**.
   b. According to #3, that "conclusion" is a *sentence* describing the relationship between two *variables*. The *subject* of that sentence is the _____________ variable. (dependent, controlled)
   c. Exchanging the positions of the two variable names in your conclusion is equivalent to confusing cause with _________. *Always try to avoid that kind of error*. #4b has been saved on RS ___.

5. As you know, "doubling" a variable means multiplying it by two.
   "Increasing a variable by a factor of three" means *tripling* its value.
   a. If one of the variables in a direct proportion is doubled, then the other variable must be ________ed.
   b. In a direct proportion what happens when you increase one variable by a factor of **N**?
      ...The other variable must __crease by the _______ factor. (same, different)
   c. For example, if the "H" value in #3 is changed from 8 inches to 24 inches, then the "Y" value must change from 15 centimeters to ____ _____. -Must we convert units to fill in those blanks? ___

6. Imagine a set of circles with different sizes. Imagine that we have measured all of the diameters and all of the circumferences and have recorded them in a data table. Then we can make a graph. The title of the graph will be **Circumference vs. Diameter**:
   * a. Describe the graph clearly. *If necessary, make the measurements.*
   * b. What can we *conclude* from the shape of that graph? (Use the word "proportional", as in 4a.)
   c. The slope of such a graph is called a "**proportionality constant**". In *this* example the slope = ___.

7. If you say that "A is proportional to B" (abbreviated as "$A \propto B$") you imply *all* of the following:
   a. First, you are saying that both A and B are __________s, as in #5. (variables, constants, irrationals)
   b. The graph of A vs. B is a ______ line through the ______, as in #4 and 6a.
   c. A "**ratio**" is a *quotient*. The ratio of A to B is a ______. (constant or variable?)
   d. That ratio is equal to the _______ of the graph.
   e. When you multiply either variable by any factor, the other variable is _________ed by the _____ _______, (as in #5) while their ratio is __________ed (doubled, halved, unchanged), *as in 7c.*
   f. The relation can also be described by the equation "**A =** ____". In that equation the symbol "__" represents the slope of that graph. In #6 such a slope was called a "__________________ constant".

8. The entire summary in #7 has been copied into #__ on the Chapter I review sheet for future reference.