Physics Problems Grading Rubric The following guidelines are used when grading free response problems on quizzes and exams. These are problems which usually count for more than 8% of the assignment. For problems that count for less than 8% of the assignment a different rubric may be used. In such cases, the rubric will be outlined on the posted grading key. In all cases, to earn full credit, the solution must be correct and contain work supporting that answer.

Subtract 1pt from the assignment – for each clerical error and improper use of units

- To count as a clerical error the student must have written something correctly that became incorrect due to transcription or oversight while writing out the solution.
  - For example, If a student solution starts with mv^2 and several lines later becomes $(1/2)mv^3$, for no reason, count that mistake as a clerical error.
- Units missing from a final answer or units added to a symbolic answer.

Subtract 20% from the problem – for a minor physics or math error

- What constitutes a minor or major physics error can be subjective. Generally, a minor physics error would be an error in one aspect of the execution of the problem while still demonstrating understanding of the underlying concept involved in the solution
  - For example, does the student start off with $K=(1/2)mv^3$ instead of $K=(1/2)mv^2$? This is a minor physics error because they understood the need to use kinetic energy but did not recall the correct formulation.
- A minor math error would be to incorrectly solve an equation using algebra, trigonometry or the calculus.
  - For example, some common math errors you might encounter include: $xx = 2x$, $(a+b)^2 = a^2+b^2$, $\tan x = \cos x / \sin x$, $d/dx(x^2) = x$.

Subtract 40% from the problem – for a major physics error

- Making a major error would be to omit an entire physics concept required in part of a solution.
  - For example, If the solution requires the concept of kinetic energy but only contains potential energy terms, the student has made a major physics error. As another example, the solution may not start from a fundamental principle or start from the wrong principle (e.g. using conservation of energy instead of conservation of momentum)

Subtract 80% from the problem – for demonstrating some understanding of the problem

- The solution contains multiple errors but demonstrates some understanding of the problem not contained in the problem statement or formula sheet
  - For example, the solution is wrong and has many mistakes but started from the correct fundamental principle.
- The solution is wrong and the student worked out the entire problem numerically. These solutions are notoriously difficulty to decipher and will lumped into this category. Students are encouraged to work through a problem algebraically and evaluate their final expression.

Subtract 100% from the problem – for no progress towards the solution

- The student has no work, has written only the answer with no supporting work or has written down information that does not pertain to the problem.
  - For example, the only work shown for the problem is the formula given in the problem statement or written on the formula sheet.