Curving Grades: $\sqrt{\textit{The square root curve}}$

On maths tests in the US, many teachers use this table to assign ratings:

Rating	Grade
A	90% to 100%
B	80% to 89%
C	65% to 79%
D	50% to 64%
F	below 50%

If an exam is particularly difficult, the teacher might "curve" the grade to raise the scores up to where they usually are. Let's say a difficult test had these statistics:

min = 20%
median = 60%
max = 75%

The teacher might "curve" the grade by adding 20% to each student's grade so the top students still get As and the bottom students still get Fs.

One teacher uses a different method of "curving" the grade:

> "When I write a test, I write one that is rigorous and covers the topic. Occasionally, I find that the test was too rigorous for the level of the students. When I do this I use an unusual curve I learned during high school called the square root curve. You multiply the square root of the original grade by 10 to get the new grade."

Q1. Let M = the old grade and C = the new grade after "curving" the grade. For this teacher's method, write a function for C in terms of M.

Tables and Graphing by Hand

Q2. Make a table of values for $0 \geq M \geq 100$.

Q3. From your table, draw the graph of C versus M.

Q4. Use your graph to estimate the new grade if a student originally scores 55%.

Q5. Use your graph to estimate the original grade if a student gets 80% for his curved grade.

Algebra

Q6. Use algebra to find the curved score if the student originally scores 42%

Q7. Use algebra to find the original score if the student gets 70% for his curved score.

Tables and Graphing with a TI-84

Q8. Now do Q2 to Q5 again, but this time using your TI-84 graphics calculator.

Problem Solving

Q9*. For what percentages are C and M the same?

Q10* Who benefits the most from this method of curving – the weaker students or the stronger students? Justify your answer.