Name: _____

Date: _____

Collaborators: _____

Question:	1	2	3	4	5	Total
Points:	10	10	10	10	15	55
Score:						

Instructor/grader comments:

Course logistics.

1. (10 points)

   ☐ I've read the Introduction, pp. 9–13, to the lecture notes *Physical Mathematics*, by Michael P. Brenner, Harvard AM201, 2010.

2. (10 points)

   ☐ I've read the Section "Low entropy expressions", from the book *Street-Fighting Mathematics*, pp. 80–82, by Sanjoy Mahajan, MIT, 2010

3. (10 points)

   ☐ I've watched in full the video recording of R. Feynman's lecture *The relation of Mathematics and Physics* which was assigned as a part of HW1.

4. (10 points)

   ☐ I've read E. Wigner's article *The Unreasonable Effectiveness of Mathematics in the Natural Sciences* which was assigned as a part of HW1.

Sign and date here: _____

Computer algebra

5. (15 points) Use Mathematica to obtain an analytical expression for the following integral:

$$f(x) = \int_{\frac{1}{2}}^{\pi-\frac{1}{2}} \sin^x(y)\,\mathrm{d}y.$$

   Plot on the same graph, for $10 \leq x \leq 50$, your result and the following approximation to the integral (that we are going to derive later in the course):

$$g(x) = \sqrt{\frac{2\pi}{x}}.$$

   Print your mathematica session and attach the printout to the rest of your homework.

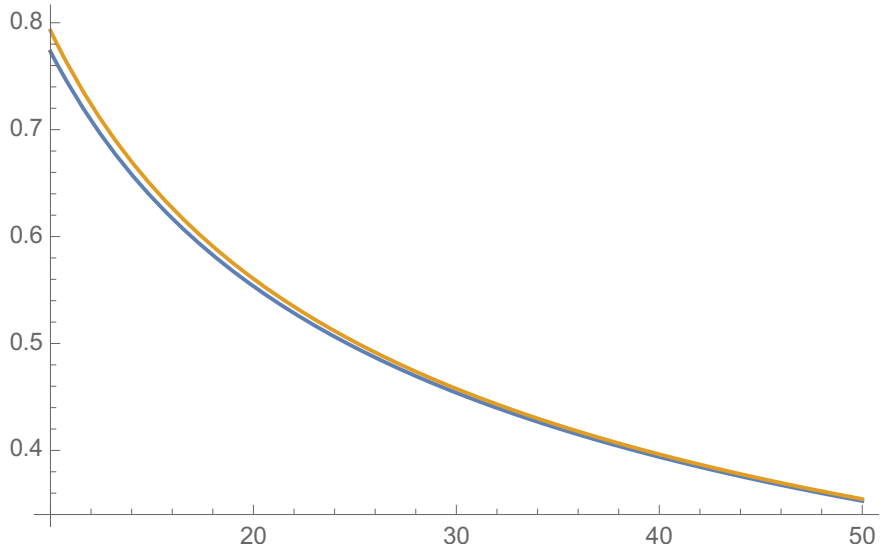

Figure 1: Problem 5: expected graph