Math Methods (PHYS 320): Special Functions

Spring 2017

Here are the special function assignments!

Your presentation will consist of a "fun facts" handout and a ∼7 min presentation focusing on one aspect of your function, such as a cool application of your special function or the highlights of the series solution.

The sequence is the order of presentation. All "1" ' s please be ready to present your special function on Tuesday, April 5. All "2" ' s and "3" ' s should be ready Thursday, April 7, etc. If the deadline is difficult for you to meet, email me immediately so I can adjust the schedule accordingly.

When you present your special function be sure to include on your fun facts sheet, if relevant:
* The ODE
* A few solutions
* The series solution
* Plots
* Orthogonality and normalization
* Generating functions
* Rodrigues formula
* Recursion relations, etc. as applicable

and

* One cool and amusing fact about the special functions.

If you would like me to make copies, please submit your "Fact Facts" pages, electronic or hard copy, at least one day before your presentation.

Person	Special Function (and a starting reference)	Sequence
Seth	Hermite polyominals	0
Marcos	Legendre (NIST Handbook, Boas 564-567, 569-572, 577-580)	1
David	Dirac Delta "function" (Boas 449-456)	1 or 2
Elise	Gamma function (Boas 538-541, 552-553 Stirling approx.)	1
Leo	Bessel functions (NIST Handbook, Boas 587-594, 601-602)	1
Tom	Laguerre (NIST Handbook, Boas 609-610)	2
Ash	Airy functions (Boas, NIST Handbook)	2
Brady	Chebyshev poly's (NIST Handbook, Brian C)	3
Eli	Associated Legendre (NIST Handbook, Boas 583-84)	3
	Associated Laguerre polynominals (NIST Handbook, Boas 610-611, prob. 20)	4
Alec	Whittaker functions (NIST Handbook)	3 or 4
RJ	Riemann Zeta function (NIST Handbook)	3 or 4
	"Other" Bessel functions (NIST Handbook, Boas 595-600,604)	4
Ryan	Hypergeometric functions (NIST Handbook)	4
	Elliptic integrals & functions (NIST Handbook, Boas 555)	4
Abby	Spherical Harmonics (NIST Handbook 378, Boas 649 & 16 on 651)	4

... or others !

Boas has a nice intro to many of these functions. MathWorld (on the web, linked to on the website) useful as well.