

**QUICK GUIDE TO
A PACKAGE FOR COMPUTING SIEVE FUNCTIONS
VERSION 0.9**

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This document briefly describes the *Mathematica*[®] package `SieveFunctions.m`, described in the Appendix to the text *A Higher-Dimensional Sieve Method with Procedures for Computing Sieve Functions*. The package should work under *Mathematica* versions 5.2 and later. Detailed documentation on *Mathematica* can be found using the system's **Help** menu, or online at www.wolfram.com. To use this package you should make sure it is in a location where *Mathematica* can find it (see the documentation on *Mathematica*'s `$Path` variable). You can then load the package with the command

<< SieveFunctions.m

The following table lists some of the functions implemented by the package:

Function	<i>Mathematica</i> equivalent	Remarks
$\xi(t)$	<code>LoglikeXi[t]</code>	See §14.6 of the text
α_κ	<code>alphaParam[κ]</code>	
β_κ	<code>betaParam[κ]</code>	
$j_\kappa(u)$	<code>jFunc[κ, u]</code>	
$\sigma_\kappa(u)$	<code>sigmaFunc[κ, u]</code>	
$f_\kappa(u)$	<code>LowerSieveFunc[κ, u]</code>	
$F_\kappa(u)$	<code>UpperSieveFunc[κ, u]</code>	
$P_\kappa(u)$	<code>SieveP[κ, u]</code>	
$Q_\kappa(u)$	<code>SieveQ[κ, u]</code>	
$p_\kappa(u)$	<code>AdjointSieveP[κ, u]</code>	
$q_\kappa(u)$	<code>AdjointSieveQ[κ, u]</code>	

Several of these functions accept further optional arguments, and the package implements other “auxiliary” functions. At this point you must refer to the source-code of the package for further information.

We do not provide the function $N_{\min}(\kappa, \mu_0, \tau)$, described in Section A1.10 of the text, since our current version does not work reliably.

The first computation of α_κ and β_κ can take several seconds, after which the result is saved for reuse. Note that several other functions, such as $f_\kappa(u)$, require the values of α_κ and β_κ , and so will also be quite slow when first invoked.

Also note that we cannot guarantee the accuracy of any results computed with this package. Questions about or comments on this package should be sent to sievetheorybook@math.uiuc.edu.