



# Average Number of Lattice Points in a Disk

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The difference between the number of lattice points in a disk of radius  $\sqrt{t}$  and the area of the disk  $\pi t$  is equal to the error in the Weyl asymptotic estimate for the eigenvalue counting function of the Laplacian on the standard flat torus. We give a sharp asymptotic expression for the average value of the difference over the interval  $0 \leq t \leq R$ . We obtain similar results for families of ellipses. We also obtain relations to the eigenvalue counting function for the Klein bottle and projective plane.

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