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On the problem of representing integers by quadratic forms

Historically, one of the most extensively studied problem in the theory of quadratic forms is finding the number of representations of an integer by a quadratic form. A well known result in this area is Jacobi's four square theorem which gives explicit formulas for the number of representations of an integer n as a sum of four squares. Another interesting insight was given by Fred van der Blij in a 1952 paper, where he gives exact formulas for the number of representations for all three equivalence classes of quadratic forms Q of discriminant -23 . In this talk, we look at a generalization of the above result for other values of the discriminant $D < 0$, such that $\mathbb{Q}(\sqrt{D})$ has class number three, using the theory of modular forms.