Let $H(d)$ be the form class group consisting of classes of primitive integral binary quadratic forms of discriminant $d$. For $K \in H(d)$ and a positive integer $n$ let $R(K, n)$ be the number of primary representations of $n$ by one of the quadratic forms in $K$. The evaluation of $R(K, n)$ is reduced to the case $\gcd(u, d) = 1$ in Section 3. Define $N(n, d) := \sum_{K \in H(d)} R(K, n)$.

In Section 4 a complete formula for $N(n, d)$ is obtained. Furthermore, it is shown that $N(n, d)$ is a multiplication function of $n$ (when $w(d) = 1, 2, 4, 6$ according as $d > 0$, $d < -4$, $d = -4$ or $d = -3$) and the Euler product for the Dirichlet series

$$\sum_{n=1}^{\infty} \frac{N(n, d)}{w(d)} n^{-s} \quad (\text{Re } s > 1)$$

is discussed.

In Section 5 explicit formulas for $R(K, p^t)$ are given, where $p^t$ is a prime power. In Sections 9–11 $R(K, u)$ is determined for $K \in H(d)$ where $H(d)$ is cyclic with order $h(d) = 2, 3$ or 4.

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  11R29 Class numbers, class groups, discriminants
  11E25 Sums of squares, etc