

**On the representation of numbers by binary quadratic forms  
belonging to multi-class genera**

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It is well-known that the number of representations of a positive integer by a positive quadratic form of one-class genera with number of variables more than four is equal to the sum of corresponding “singular series”. We worked out a full solution of defining “singular series” for arbitrary positive quadratic form and proved that half of “the sum of generalized singular series” that corresponds to a binary quadratic form is equal to the average number of representations of a natural number by the genus containing this quadratic form. Moreover, convenient formulas are obtained for calculating of values of “the sum of generalized singular series”. Using these formulas by means of the theory of modular forms we obtain the formulae for a number of representations of numbers by binary quadratic forms belonging to multi-class genera. Some of these binary forms were considered in [KW].

[KW] Pierre Kaplan & Kenneth S. Williams, “On the number of representations of a positive integer by a binary quadratic form”, *Acta Arith.*, 114, 1, 87–98 (2004).