SUR LE 3-RANG DU GROUPE DE CLASSES DE CERTAINS CORPS QUADRATIQUES RÉELS

ABDELMALEK AZIZI, MOHAMED TALBI, and MOHAMMED TALBI

Abstract. We determine a family of real quadratic fields whose 3-rank of class groups is greater than or equal to 2.

REFERENCES

[1] Craig, M., *A type of class group for imaginary quadratic fields*, Acta Arith., **22** (1973), 449–459.

[2] Craig, M., *A construction for irregular discriminants*, Osaka J. Math., **14** (1977), *2*, 356–402.

[3] Diaz y Diaz, F., *Sur le 3-rang des corps quadratiques*, Pub. Math. d'Orsay 78, *11*, Université de Paris-Sud, Département de Mathématique, Orsay, 1978.

[4] Diaz y Diaz, F., *On some families of imaginary quadratic fields*, Math. Comp., **32** (1978), *142*, 637–650.

[5] Diaz y Diaz, F., Shanks, D. and Williams, H.C., *Quadratic fields with 3-rank equal to* 4, Math. Comp., **33** (1979), *146*, 836–840.

[6] Kishi, Y., *A criterion for a certain type of imaginary quadratic fields to have 3-ranks of the ideal class groups greater than one*, Proc. Japan Acad. Ser. A Math. Sci., **74** (1998), 93–97.

[7] Kishi, Y., *A constructive approch to Spiegelung relations betwen 3-ranks of absolute ideal class group and congruent ones modulo* $(3)^2$ *in quadratic fields*, J. Number Theory, **83** (2000), 1–49.

[8] Kishi, Y. and Miyake, M., *Characterization of the quadratic fields whose class number are divible by three*, J. Number Theory, **80** (2000), 209–217.

[9] Llorente, P., Nart, E. and Vila, N., *Decomposition of primes in number fields defined by trinomials*, J. Théor. Nombres Bordeaux, **3** (1991), *1*, 27–41.

[10] Louboutin, S., *Class number and class group problems for some non-normal totally real cubic number fields*, Manuscripta Math., **106** (2001), 411–427.

[11] Quer, J., *Corps quadratiques de 3-rang* 6 *et courbes elliptiques de rang* 12, C. R. Math. Acad. Sci. Paris, Sér. I, **305** (1987), *6*, 215–218.

[12] Shanks, D. and Weinberger, P., *A quadratic field of prime discriminant requiring three generators for its class group and related theory*, Acta Arith., **21** (1972), 71–87.

[13] Shanks, D., *New types of quadratic fields having three invariants divisible by* 3, J. Number Theory, **4** (1972), 537–556.

Université Mohamed Premier
Faculté des Sciences
Département de Mathématiques et Informatique
Oujda, Maroc
E-mail: `abdelmalekazizi@yahoo.fr`
E-mail: `ksirat1971@yahoo.fr`
E-mail: `talbimm@yahoo.fr`