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Problem: How many triples a, b, c of real numbers are there such that a, b, c are the roots of the equation x^3 + ax^2 + bx + c = 0?

Solution: Sum of the roots, a+b+c = -a => 2a+b+c = 0 --------(1)

Sum of the roots taken two at a time, ab+bc+ca = b => c = (b-ab)/(a+b) -------(2)

Product of the roots, abc = -c => ab = -1; b = -1/a ------(3)

put b = -1/a in (1), we get c = (2a^2-1)/a -----(4)

put b = -1/a in (2), we get c = 1/(a+1) ----(5)

Equating (4) and (5), we get 2a^3 + 2a^2-2a -1 = 0.

Solving this cubic equation, we get a = -1.4516, -0.40303, 0.85464.

Corresponding b's are 0.6889, 2.4812, -1.1701

Corresponding c's are = -2.2143, 1.6751, 0.5392

Thus we have three triplets, satisfying the required condition.