

Difficult Round

1. Given six non-collinear, coplanar points, how many triangles can be formed using these points?
2. In how many ways can 5 persons be seated around a circular table if two of them insist on sitting beside each other?
3. What are the x-intercepts of the function $f(x) = x^2(x+3)(x-2)$?
4. According to Descartes' rule of signs, how many positive zeros does the polynomial function $f(x) = 4x^5 - 6x^3 + 2x^2 - 6x - 9$ have?
5. What is the remainder of $3x^{100} - 4$ divided by $(x+1)$?

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