

Albania Team Selection Test 2009

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by ridgers

- 1 An equilateral triangle has inside it a point with distances 5,12,13 from the vertices . Find its side.

- 2 Find all the functions $f : \mathbb{R} \mapsto \mathbb{R}$ with the following property: $\forall x f(x) = f(x/2) + (x/2)f'(x)$

- 3 Two people play a game as follows: At the beginning both of them have one point and in every move, one of them can double it's points, or when the other have more point than him, subtract to him his points. Can the two competitors have 2009 and 2002 points respectively? What about 2009 and 2003? Generally which couples of points can they have?

- 4 Find all the natural numbers m, n such that $1 + 5 \cdot 2^m = n^2$.
