Azerbaijan IMO TST 2016 First Round

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1   Find the maximum value of natural components of number 96 that we can seperate such that all of them must be relatively prime number withh each other.

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2 ABC be atriangle with sides $AB = 20$, $AC = 21$ and $BC = 29$. Let D and E be points on the side BC such that $BD = 8$ and $EC = 9$. Find the angle $\angle DAE$.

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3   Find the solution of the equation $8x(2x^2 - 1)(8x^4 - 8x^2 + 1) = 1$ in the interval $[0, 1]$?

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4   Find the solution of the functional equation $P(x) + P(1 - x) = 1$ with power 2015

P.S: $P(y) = y^{2015}$ is also a function with power 2015

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5   The largest side of the triangle ABC is equal to 1 unit. Prove that , the circles centred at A, B and C wit radiuses $\frac{1}{\sqrt{3}}$ can compeletely cover the triangle ABC.