JULY 2009

EXERCISE I (5pts)

The complex plane is related the direct orthogonal frame $(0, \vec{u}, \vec{v})$, graphic unit: 2cm.

- 1. Draw the circle whose centre is 0 and the radius 1 and
- 2. Indicate points *A*, *B* and *D* with respective affixes $\sqrt{3} + i$, $\sqrt{3} i$ and $-\frac{1}{2} + \frac{\sqrt{3}}{2}i$ (1marke)
- 3. We consider the rotation R with centre 0 and angle $\frac{\pi}{3}$ and the translation T of vector with affix IR
- a) Determine affixes $Z_{A'}$ and Z_B of points A' and B, respective image of A and B under the rotation R (0.75 markes)
- b) Determine the affix $Z_{D'}$ of D' where D' is image of D under the translation T (0.75markes)
- c) Indicate points A', B' and D'. Determine the argument of the complex number $\frac{Z_A' Z_B'}{Z_A'}$

Prove that the line (OD') is a median of triangle(OA'B').

EXERCISES 2 AND 3 EXIST IN 2010 AHEAD.

EXERCISE 4(4PTS)

This exercise has 4 affirmations. Indicate for each of them if it is true or false and justify your answer. Given the function defined by $f(x) = In\left(\frac{2x+1}{x-1}\right)$

- 1. f is defined on]1; + ∞ [(0.5markes)
- 2. $f'(x) = -\frac{1}{(x-1)^2} In\left(\frac{2x+1}{x-1}\right)$ (1markes)
- 3. Line x = 1 is asymptote ton the representative curve of f.

The representative curve of f admit a horizontal asymptote.(0.75mark