

translation

N°1) \vec{u} denotes a given vector, M denotes a point, and M' is the image of M under $t_{\vec{u}}$.

- a) what is the locus of M' when M describes a fixed line (d) ?
- b) what is the locus of M' when M describes a fixed circle (c) ?

N°2) M describes a fixed circle with diameter $[AB]$ and center O , N is the point such that $OAON$ is a parallelogram. what is the locus of N when M describes the circle?

N°3) ABC is a triangle such that B and C are fixed. Assume that the midpoint of $[AB]$ describes a fixed circle (c) . what is the locus of the midpoint of $[AC]$?

N°4) $[AB]$ is a given segment. f denotes the mapping from the plane into itself that associates to every point M the point M' such that $\vec{MA} + 2\vec{MM'} = \vec{MB}$.

prove that f is a translation whose vector is to be specified.

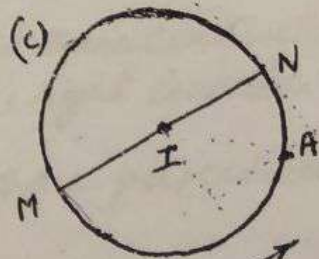
N°5) the plane is referred to a system (O, \vec{i}, \vec{j}) , t denotes the translation with vector $\vec{v}(2, -3)$ and let $M'(x', y')$ be the image of the point $M(x, y)$ by t .

- a) Express x and y in terms of x' and y'
- b) Let (d) be the line of equation $2x + 5y - 3 = 0$. determine the equation of the line (d') the image of (d) under t .
- c) consider the circle (c) of center $I(1, -1)$ and radius 2. Find the image of (c) by t .

N°6) (c) is a variable circle of center I and of a constant radius R passing through a fixed point A .

$[MN]$ is a variable diameter such that $\vec{MN} = \vec{v}$ where \vec{v} is a given vector.

- 1) Determine the set of points I as the circle varies
- 2) show that N is the image of I by a simple transformation



- to be determined. Deduce the set of points N as (c) varies.
- 3) Determine the set of points M as the circle (c) varies.

Nº7) On a fixed axis $x'Ox$, consider a variable point A and construct an isosceles triangle of base $[OA]$ and vertex M . Let W be the center of circle (c) circumscribed about triangle OAM . Suppose that the radius of (c) is constant.

- 1) Determine the set of points W as A varies.
- 2) By which simple transformation is W mapped onto M ?
- 3) Determine the set of points M

Nº8) (c) and (c') are two fixed circles intersecting in two points A and B and of respective centers O and O' . A variable secant (d) passing through A cuts (c) and (c') in I and J respectively.

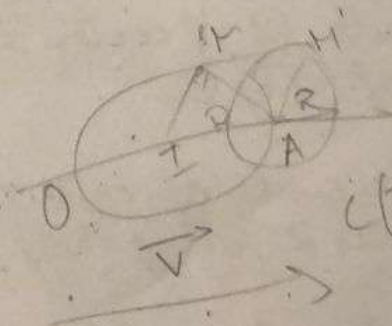
the perpendicular through I to (d) cuts (c) in K .

the perpendicular through J to (d) cuts (c') in L .

the parallel through I to (OO') cuts (JL) in M .

the parallel through J to (OO') cuts (KI) in N .

- 1) prove that the points K , B and L , are collinear.
- 2) a) show that $\vec{IM} = 2\vec{OO'}$
- b) Deduce the set of points M as (d) varies
- c) Find the set of points N as (d) varies.



$$C(I, R) \rightarrow C'(I')$$