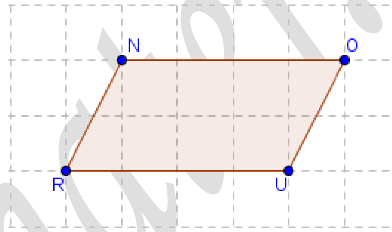
I- *NOUR* is a parallelogram of center *I*. *K* is the midpoint of [*IO*] and *F* is the midpoint of [*IR*].

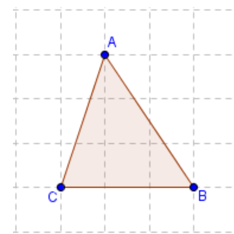
a. Prove that *NKUF* is a parallelogram.
b. Prove that the triangles *FUR* and *NKO* are congruent.

II- Consider the parallelogram *NOUR*.



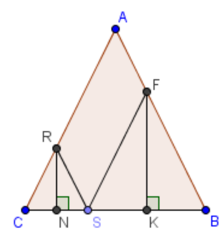
a. Plot *K* the midpoint of [*NR*]
b. Construct *F* the symmetric of *O* with respect to *K*.
c. Prove that *NFKO* is a parallelogram.
d. Justify that the points *F*, *R* and *U* are collinear.
e. Deduce that *R* is the midpoint of [*FU*].

III- *ABC* is a triangle where *R* & *N* are the respective midpoints of the sides [*AB*] & [*AC*].



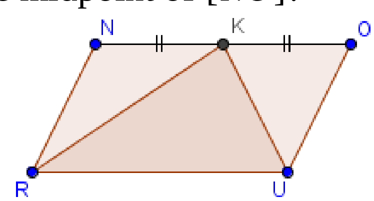
a. Construct *K* the symmetric of *C* with respect to *R* and *F* the symmetric of *B* with respect to *N*.
b. Prove that *ACBK* and *ABCF* are two parms.
c. Deduce that the point *K*, *A* & *F* are collinear.
d. Prove that *F* is the symmetric of *K* with respect to *A*.

IV- Given that triangle, *ABC* is isosceles of vertex *A*. Such that, (*RN*) is the perpendicular bisector of [*BS*] and (*FK*) is the perpendicular bisector of [*SC*].



a. Show that *RSFA* is a parallelogram.
b. Prove that the perimeter of *RSFA* is equal double the measure of [*AB*].

V- Consider the parallelogram *NOUR*, so that $NO = 2OU$, and *K* is the midpoint of [*NO*].

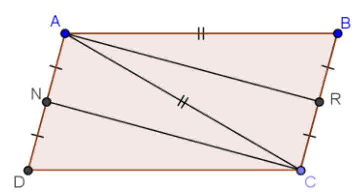


a. Show that *RK* is the bisector of $N\hat{R}U$.
b. Prove that *UK* is the bisector of $O\hat{U}R$.
c. Compute the measure of $R\hat{K}U$.

VI- Given that *N* is any point on a circle *C*(O;3*cm*).

a. Draw figure.
b. Plot the diametrically opposite points *F* & *K*.
c. Mark the point *R* the symmetric of *N* with respect to *O*.
d. What is the nature of quadrilateral *NFRK*?

VII- Consider the parallelogram *ABCD*.



a) Indicate the properties included in the adjacent figure.
b) Prove that *ARCN* is a rectangle.

VIII- Let $C(O; R)$ and $C'(O'; R)$ be two intersecting circles.

a. Draw figure.

b. (C) & (C') intersect at the points R & N. What is the nature of the quadrilateral $ORO'N$?

IX- *ROME* is a square of center N.

a. Construct sketch.

b. Let J be any point of $[RM]$. Locate K the symmetric of J with respect to O.

c. What is the nature of quadrilateral *JOKE*?

X- *CORE* is a parallelogram such that $CO = 2OR$.

a. Sketch the figure.

b. Let N & K be the respective midpoints of sides CO and RE.

i. Prove that *NORK* and *CNKE* are two rhombuses.

ii. Show that triangle *COK* is right at K.

XI- $x\hat{O}y$ *and* $y\hat{O}z$ are two adjacent supplementary angles. Let B & C be the feet of perpendiculars issued from the point A of $[Oy)$ to the bisectors of $x\hat{O}y$ *and* $y\hat{O}z$.

a. Show that quadrilateral *OBAC* is a rectangle.

b. Prove that the straight line (BC) is parallel to (xz).

XII- Consider the rectangle *ABCD* such that $AB = 2BC$. Let I & J be the respective midpoints of $[AB]$ and $[CD]$.

a. Assemble the figure.

b. Show that $[BJ)$ is the bisector of angle $A\hat{B}C$.

c. Show that $A\hat{J}B. = 90^\circ$.

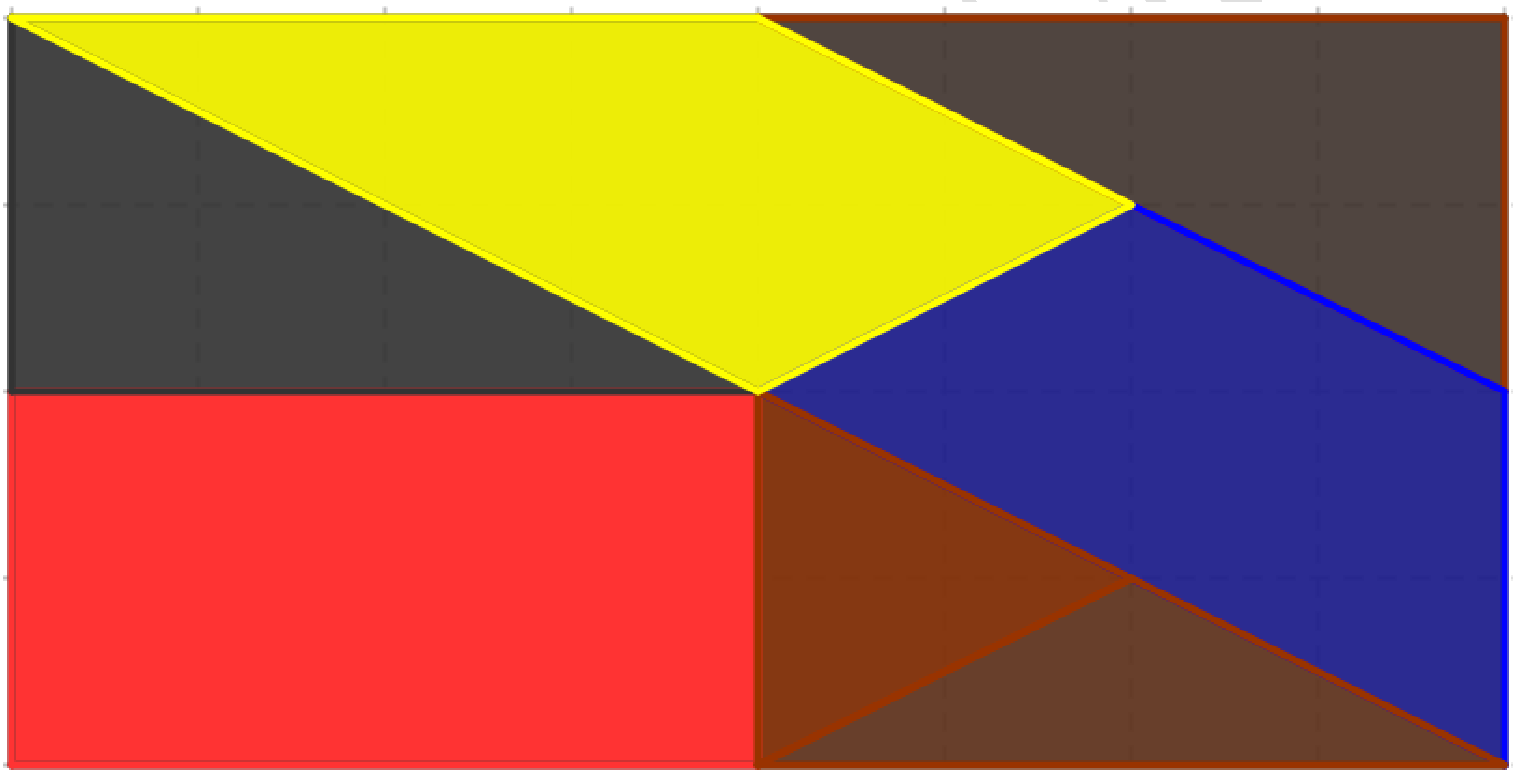
d. Prove triangle *DIC* is a right isosceles triangle.

e. $[AJ]$ intersects $[DI]$ in N and $[BJ]$ intersects $[CI]$ in M. what is the nature of quadrilateral *MJNI*.

XIII- Let *ABCD* be a parallelogram of center T. Use the given data to compute the missing values.

Given that: $A\hat{B}C = 135^\circ$ *R.T.F:* $B\hat{A}D$.
Given that: $AC = 5x - 12$ *and* $AT = 14$.   *R.T.F:* x.
Given that: $AB = 6, BC = 9$ *and* $A\hat{B}C = 80^\circ$.   *R.T.F:* CD.
Given that: $BT = 3x + 1$ *and* $BD = 4x + 8$.   *R.T.F:* x.
Given that: $BC = 4x - 7$ *and* $AD = 8x - 5$.   *R.T.F:* x.
Given that: $B\hat{C}D = 3x + 14$ *and* $A\hat{D}C = x + 10$.   *R.T.F:* $A\hat{D}C$.

The parallelogram mystery



Cut the colored pieces of the above figure to form a parallelogram.