

## Fuhrmann Center

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**Abstract.** By using the computer program "Machine for Questions and Answers", we find properties of the Fuhrmann Center.

The *Fuhrmann Center* is the center of the Fuhrmann Circle.

Given a point, the Machine for Questions and Answers produces theorems related to properties of the point. The Machine for Questions and Answers produces theorems related to properties of the Fuhrmann Center:

Fuhrmann Center = Nagel Point of the Euler Triangle.

Fuhrmann Center = Incenter of the Johnson Triangle.

Fuhrmann Center = Center of the Circumcircle of the Fuhrmann Triangle.

Fuhrmann Center = Center of the Second Droz-Farny Circle of the Fuhrmann Triangle.

Fuhrmann Center = Center of the Incircle of the Johnson Triangle.

Fuhrmann Center = Center of the Conway Circle of the Johnson Triangle.

Fuhrmann Center = Center of the Hexyl Circle of the Johnson Triangle.

Fuhrmann Center = Center of the Adams Circle of the Johnson Triangle.

Fuhrmann Center = Center of the Outer Apollonius Circle of the Lucas Circles of the Fuhrmann Triangle.

Fuhrmann Center = Midpoint between the Nagel Point and the Orthocenter.

Fuhrmann Center = Reflection of the Incenter in the Nine-Point Center.

Fuhrmann Center = Reflection of the Circumcenter in the Spieker Center.

Fuhrmann Center = Reflection of the Bevan Point in the Midpoint of the Circumcenter and the Nagel Point.

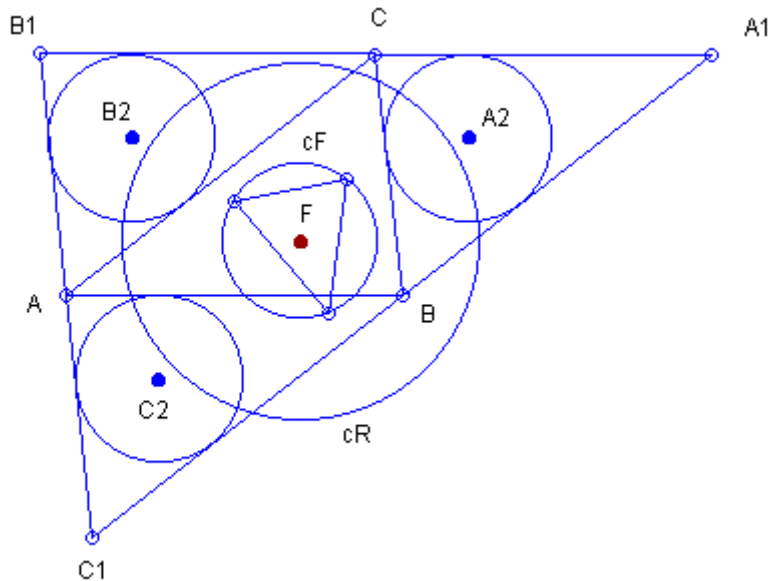
Fuhrmann Center = Inverse of the Nine-Point Center in the Orthocentroidal Circle of the

Fuhrmann Triangle.

Fuhrmann Center = Radical Center of the Soddy Circles of the Johnson Triangle.

Fuhrmann Center = Radical Center of the Triad of the Incircles of the Corner Triangles of the Anticevian Triangle of the Centroid.

See the Figure:



$A_1B_1C_1$  - Anticevian Triangle of the Centroid = Anticomplementary Triangle;

$(A_2)$  = Incircle of triangle  $A_1BC$ ;

$(B_2)$  = Incircle of triangle  $B_1CA$ ;

$(C_2)$  = Incircle of triangle  $C_1AB$ ;

$cR$  - Radical Circle of circles  $(A_2)$ ,  $(B_2)$  and  $(C_2)$ ;

$cF$  - Fuhrmann Circle;

$F$  - Fuhrmann Center = Radical Center of circles  $(A_2)$ ,  $(B_2)$  and  $(C_2)$ .

Fuhrmann Center = Radical Center of the Triad of the Adams Circles of the Corner Triangles of the Anticevian Triangle of the Centroid.

Fuhrmann Center = Perspector of the Cevian Triangle of the Center of the Fuhrmann Circle and the Anticevian Triangle of the Center of the Fuhrmann Circle.

Fuhrmann Center = Perspector of the Cevian Triangle of the Center of the Fuhrmann Circle and the Circumcevian Triangle of the Center of the Fuhrmann Circle.

Fuhrmann Center = Perspector of the Anticevian Triangle of the Center of the Fuhrmann Circle and the Circumcevian Triangle of the Center of the Fuhrmann Circle.

Fuhrmann Center = Homothetic Center of Triangle  $ABC$  and the Triangle of the Centers of

the Fuhrmann Circles of the Corner Triangles of the Centroid.

Fuhrmann Center = Perspector of Triangle ABC and the Triangle of the reflections of the Center of the Fuhrmann Circle in the vertices of the Cevian Triangle of the Center of the Fuhrmann Circle.

Fuhrmann Center = Perspector of Triangle ABC and the Triangle of the reflections of the Center of the Fuhrmann Circle in the vertices of the Anticevian Triangle of the Center of the Fuhrmann Circle.

Fuhrmann Center = Perspector of Triangle ABC and the Triangle of the reflections of the vertices of the Cevian Triangle of the Center of the Fuhrmann Circle in the Center of the Fuhrmann Circle.

Fuhrmann Center = Perspector of Triangle ABC and the Triangle of the reflections of the vertices of the Anticevian Triangle of the Center of the Fuhrmann Circle in the Center of the Fuhrmann Circle.

Fuhrmann Center = Homothetic Center of the Incentral Triangle and the Triangle of the reflections of the Center of the Fuhrmann Circle in the vertices of the Incentral Triangle.

Fuhrmann Center = Homothetic Center of the Medial Triangle and the Triangle of the Centroids of the Triangulation Triangles of the Center of the Fuhrmann Circle.

Fuhrmann Center = Homothetic Center of the Medial Triangle and the Triangle of the Centers of the Fuhrmann Circles of the Anticevian Corner Triangles of the Centroid.

Fuhrmann Center = Homothetic Center of the Medial Triangle and the Triangle of the reflections of the Center of the Fuhrmann Circle in the vertices of the Medial Triangle.

Fuhrmann Center = Homothetic Center of the Orthic Triangle and the Triangle of the reflections of the Center of the Fuhrmann Circle in the vertices of the Orthic Triangle.

Fuhrmann Center = Homothetic Center of the Symmedial Triangle and the Triangle of the reflections of the Center of the Fuhrmann Circle in the vertices of the Symmedial Triangle.

Fuhrmann Center = Homothetic Center of the Intouch Triangle and the Triangle of the reflections of the Center of the Fuhrmann Circle in the vertices of the Intouch Triangle.

Fuhrmann Center = Homothetic Center of the Extouch Triangle and the Triangle of the reflections of the Center of the Fuhrmann Circle in the vertices of the Extouch Triangle.

Fuhrmann Center = Homothetic Center of the Excentral Triangle and the Triangle of the reflections of the Center of the Fuhrmann Circle in the vertices of the Excentral Triangle.

Fuhrmann Center = Homothetic Center of the Anticomplementary Triangle and the Triangle of the reflections of the Center of the Fuhrmann Circle in the vertices of the Anticomplementary Triangle.

Fuhrmann Center = Homothetic Center of the Tangential Triangle and the Triangle of the

reflections of the Center of the Fuhrmann Circle in the vertices of the Tangential Triangle.

Fuhrmann Center = Perspector of the Johnson Triangle and the Triangle of the Centers of the Fuhrmann Circles of the Corner Triangles of the Nagel Point.

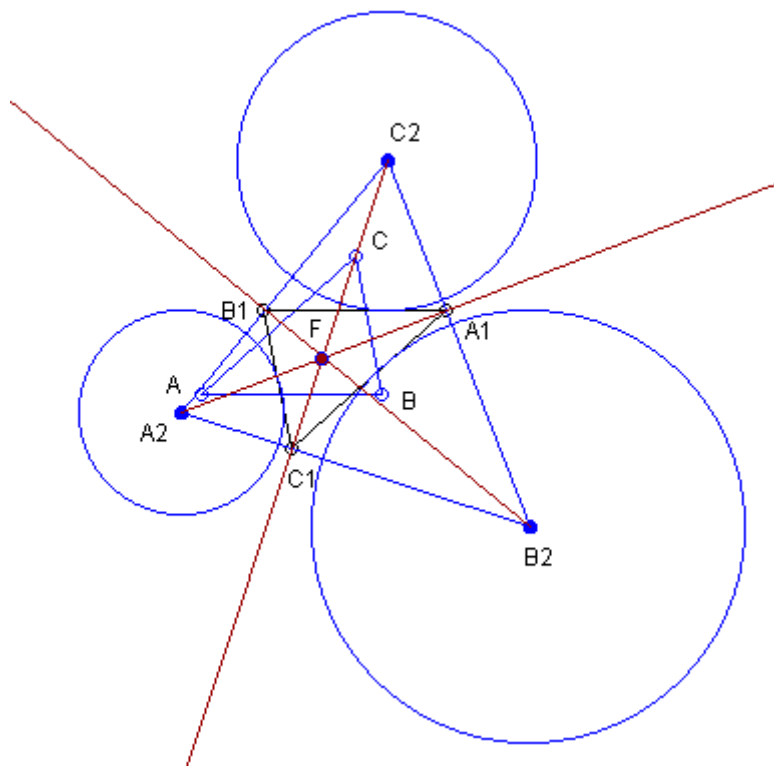
Fuhrmann Center = Perspector of the Johnson Triangle and the Triangle of the reflections of the Center of the Fuhrmann Circle in the sides of the Intouch Triangle.

Fuhrmann Center = Perspector of the Johnson Triangle and the Triangle of the reflections of the Center of the Fuhrmann Circle in the sides of the Excentral Triangle.

Fuhrmann Center = Perspector of the Johnson Triangle and the Triangle of the reflections of the Circumcenter in the vertices of the Anticevian Triangle of the Grinberg Point.

Fuhrmann Center = Inner Johnson Perspector of the Excircles of the Johnson Triangle.

See the Figure:



$A_1B_1C_1$  - Johnson Triangle = Inner Johnson Triangle of the Excircles of the Johnson Triangle;

$A_2B_2C_2$  - Excentral Triangle of the Johnson Triangle;

F - Fuhrmann Center = Inner Johnson Perspector of the Excircles of the Johnson Triangle = perspector of triangles  $A_1B_1C_1$  and  $A_2B_2C_2$ .

Fuhrmann Center = Perspector of the Inner Lucas Triangle and the Inner Apollonius Triangle of the Lucas Circles of the Circumcevian Triangle of the Center of the Fuhrmann

Circle.

Fuhrmann Center = Anticomplement of the Midpoint between the Circumcenter and the Incenter.

Fuhrmann Center = Complement of the Reflection of the Orthocenter in the Incenter.

Fuhrmann Center = Complement of the Reflection of the Nagel Point in the Circumcenter.

The Fuhrmann Center lies on the Brocard Circle of the Fuhrmann Triangle.

The Fuhrmann Center lies on the Line through the Incenter and the Nine-Point Center.

The Fuhrmann Center lies on the Line through the Incenter and the Second Feuerbach Point.

The Fuhrmann Center lies on the Line through the Incenter and the Johnson Midpoint.

The Fuhrmann Center lies on the Line through the Circumcenter and the Spieker Center.

The Fuhrmann Center lies on the Line through the Nagel Point and the Orthocenter.

The Fuhrmann Center lies on the Line through the Nine-Point Center and the Second Feuerbach Point.

The Fuhrmann Center lies on the Line through the First Feuerbach Point and the Incenter.

The Fuhrmann Center lies on the Line through the First Feuerbach Point and the Nine-Point Center.

The Fuhrmann Center lies on the Line through the First Feuerbach Point and the Second Feuerbach Point.

The Fuhrmann Center lies on the Line through the First Feuerbach Point and the Johnson Midpoint.

The Fuhrmann Center lies on the Line through the Circumcenter and the Perspector of the Extouch Triangle and the Tangential Triangle.

The Fuhrmann Center lies on the Line through the Circumcenter and the Midpoint of the Circumcenter and the Spieker Center.

The Fuhrmann Center lies on the Line through the Circumcenter and the Internal Center of Similitude of the Circumcircle and the Spieker Circle.

The Fuhrmann Center lies on the Line through the Circumcenter and the External Center of Similitude of the Circumcircle and the Spieker Circle.

The Fuhrmann Center lies on the Line through the First Feuerbach Point and the Midpoint of the Incenter and the Nine-Point Center.

The Fuhrmann Center lies on the Line through the Center of the Inner Johnson-Yff Circle and the Orthocenter of the Intouch Triangle.

The Fuhrmann Center lies on the Line through the Complement of the Nine-Point Center and the Internal Center of Similitude of the Bevan Circle and the Nine-Point Circle.

The Fuhrmann Center lies on the Line through the Internal Center of Similitude of the Circumcircle and the Spieker Circle and the Perspector of the Extouch Triangle and the Tangential Triangle.

The Fuhrmann Center lies on the Line through the External Center of Similitude of the Circumcircle and the Spieker Circle and the Perspector of the Extouch Triangle and the Tangential Triangle.

The Fuhrmann Center lies on the Line through the External Center of Similitude of the Circumcircle and the Spieker Circle and the Internal Center of Similitude of the Circumcircle and the Spieker Circle.

### **Invitation**

The reader is invited to submit a note/paper containing

- synthetic proofs of theorems from this paper,
- or, applications of theorems from this paper,
- or, additional references related to this paper.

### **Definitions**

We use the definitions in accordance with [1 - 5] and papers published in this journal.

### **The Level**

The Machine for Questions and Answers is used to produce results in this paper. Currently the Machine has 6 levels of depths - 0,1,2,3,4,5. We use for this paper the level 0, that is, the Machine produces only elementary results. If we need deeper investigation, we have to use a level bigger than 0. Since the Machine for Questions and Answers produces too many results, it is suitable we to use bigger levels upon request, that is, for specific questions.

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