

Fermat Triangles

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Abstract. By using the computer program "Machine for Questions and Answers", we find triangles perspective with the Outer and Inner Fermat Triangles.

The Machine for Questions and Answers produces theorems related to perspectives of the Outer and Inner Fermat Triangles. A few examples are given below.

Outer Fermat Triangle

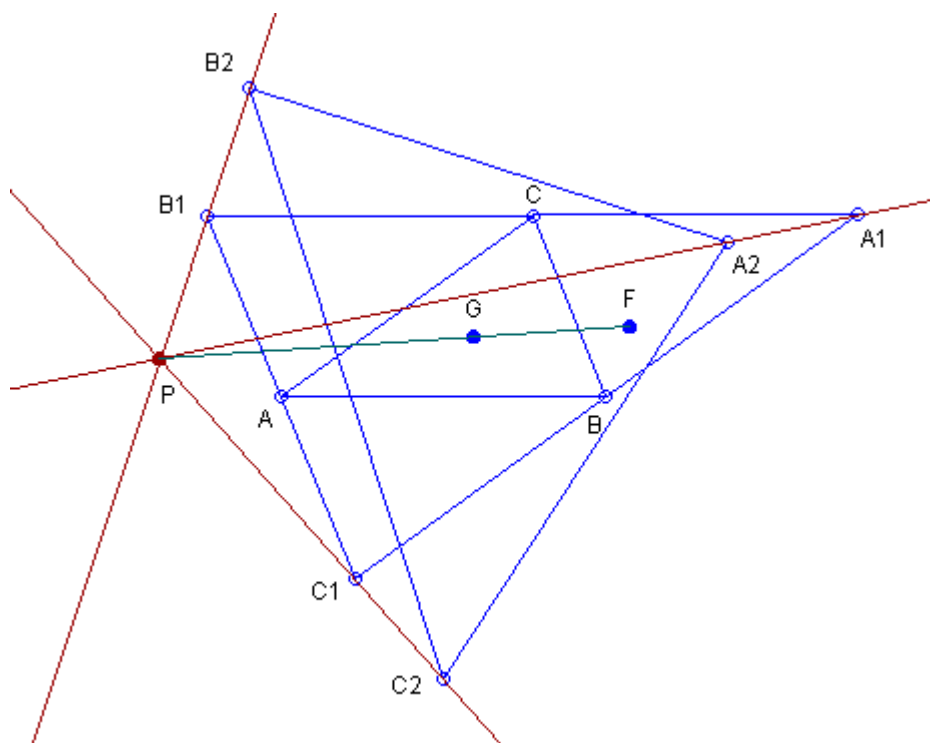
The Outer Fermat Triangle is perspective with Triangle ABC.

The Outer Fermat Triangle is perspective with the Medial Triangle.

The Outer Fermat Triangle is perspective with the Excentral Triangle.

The Outer Fermat Triangle is perspective with the Anticomplementary Triangle.

See the Figure:



$A_1B_1C_1$ - Anticomplementary Triangle;
 $A_2B_2C_2$ - Outer Fermat Triangle;
P - perspector of triangles $A_1B_1C_1$ and $A_2B_2C_2$.

Note

By using the Machine for Questions and Answers, we could specify the perspector P, e.g. as the Anticomplement of the Inner Fermat Point F. That is, if G is the Centroid, then P, G and F lie on the same line and the length of the line segment GP is two times the length of the line segment GF.

The Outer Fermat Triangle is perspective with the Tangential Triangle.

The Outer Fermat Triangle is perspective with the Anticevian Triangle of the First Isodynamic Point.

The Outer Fermat Triangle is perspective with the Anticevian Triangle of the Outer Napoleon Point.

The Outer Fermat Triangle is perspective with the Antipedal Triangle of the Nine-Point Center.

The Outer Fermat Triangle is homothetic to the Antipedal Triangle of the Outer Napoleon Point.

The Outer Fermat Triangle is perspective with the Antipedal Triangle of the Inner Napoleon Point.

The Outer Fermat Triangle is perspective with the Antipedal Triangle of the Kosnita Point.

The Outer Fermat Triangle is perspective with the Circum-Incentral Triangle.

The Outer Fermat Triangle is perspective with the Fuhrmann Triangle.

The Outer Fermat Triangle is perspective with the Reflection Triangle.

The Outer Fermat Triangle is perspective with the First Brocard Triangle.

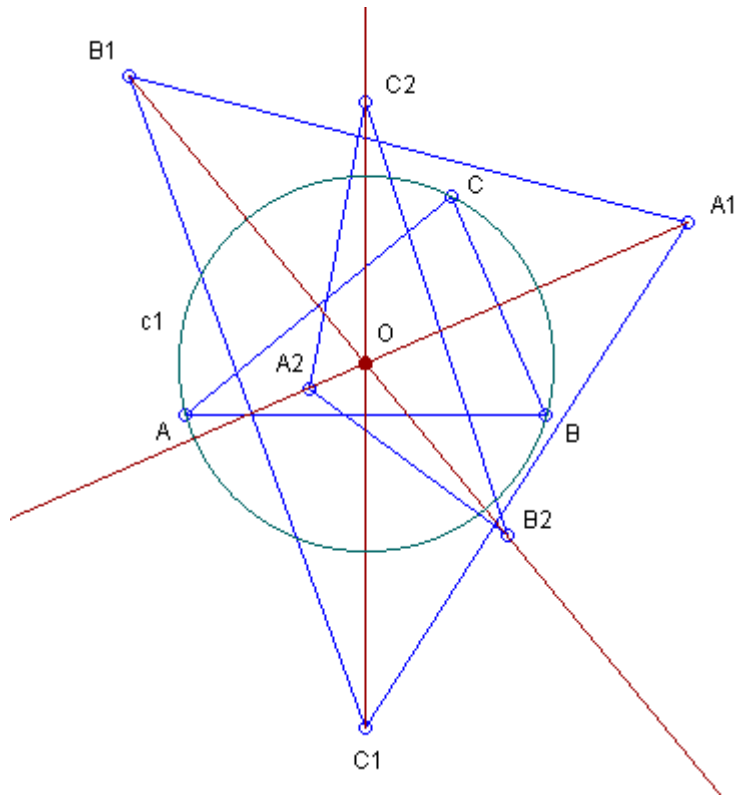
The Outer Fermat Triangle is perspective with the Neuberg Triangle.

The Outer Fermat Triangle is perspective with the Reflected Neuberg Triangle.

The Outer Fermat Triangle is perspective with the Johnson Triangle.

The Outer Fermat Triangle is perspective with the Inner Fermat Triangle.

See the Figure:



$A_1B_1C_1$ - Outer Fermat Triangle;
 $A_2B_2C_2$ - Inner Fermat Triangle;
 Triangles $A_1B_1C_1$ and $A_2B_2C_2$ are perspective at the Circumcenter O.

The Outer Fermat Triangle is perspective with the Outer Napoleon Triangle.

The Outer Fermat Triangle is perspective with the Inner Napoleon Triangle.

The Outer Fermat Triangle is perspective with the Outer Vecten Triangle.

The Outer Fermat Triangle is perspective with the Inner Vecten Triangle.

The Outer Fermat Triangle is perspective with the Medial Triangle of the Medial Triangle.

The Outer Fermat Triangle is perspective with the Orthic Triangle of the Medial Triangle.

The Outer Fermat Triangle is perspective with the Medial Triangle of the Cevian Triangle of the de Longchamps Point.

The Outer Fermat Triangle is perspective with the Euler Triangle of the Medial Triangle.

The Outer Fermat Triangle is perspective with the Reflection Triangle of the Medial Triangle.

The Outer Fermat Triangle is perspective with the First Brocard Triangle of the Medial Triangle.

The Outer Fermat Triangle is perspective with the Neuberg Triangle of the Medial Triangle.

The Outer Fermat Triangle is perspective with the Reflected Neuberg Triangle of the Medial Triangle.

The Outer Fermat Triangle is perspective with the Anticevian Triangle of the Orthocenter of the Medial Triangle.

The Outer Fermat Triangle is perspective with the Pedal Triangle of the Circumcenter of the Medial Triangle.

The Outer Fermat Triangle is perspective with the Pedal Triangle of the Orthocenter of the Medial Triangle.

The Outer Fermat Triangle is homothetic to the Antipedal Triangle of the Outer Napoleon Point of the Medial Triangle.

The Outer Fermat Triangle is perspective with the Antipedal Triangle of the de Longchamps Point of the Medial Triangle.

The Outer Fermat Triangle is perspective with the Circum-Orthic Triangle of the Medial Triangle.

The Outer Fermat Triangle is perspective with the Circumcevian Triangle of the Circumcenter of the Orthic Triangle.

The Outer Fermat Triangle is homothetic to the Outer Fermat Triangle of the Medial Triangle.

The Outer Fermat Triangle is perspective with the Inner Fermat Triangle of the Medial Triangle.

The Outer Fermat Triangle is perspective with the Outer Napoleon Triangle of the Medial Triangle.

The Outer Fermat Triangle is perspective with the Inner Napoleon Triangle of the Medial Triangle.

The Outer Fermat Triangle is perspective with the Outer Vecten Triangle of the Medial Triangle.

The Outer Fermat Triangle is perspective with the Inner Vecten Triangle of the Medial Triangle.

The Outer Fermat Triangle is perspective with the Anticevian Triangle of the Second Isodynamic Point of the Excentral Triangle.

The Outer Fermat Triangle is perspective with the Anticomplementary Triangle of the Anticomplementary Triangle.

The Outer Fermat Triangle is perspective with the Anticevian Triangle of the Inner Fermat Point of the Anticomplementary Triangle.

The Outer Fermat Triangle is perspective with the Anticevian Triangle of the Inner Fermat Point of the Anticevian Triangle of the Outer Fermat Point.

The Outer Fermat Triangle is perspective with the Medial Triangle of the Excentral Triangle.

The Outer Fermat Triangle is perspective with the Cevian Triangle of the Second Isodynamic Point of the Excentral Triangle.

The Outer Fermat Triangle is perspective with the Cevian Triangle of the Inner Fermat Point of the Anticomplementary Triangle.

The Outer Fermat Triangle is perspective with the Medial Triangle of the Tangential Triangle.

The Outer Fermat Triangle is perspective with the Pedal Triangle of the Circumcenter of the Excentral Triangle.

The Outer Fermat Triangle is perspective with the Pedal Triangle of the Nine-Point Center of the Anticomplementary Triangle.

The Outer Fermat Triangle is perspective with the Pedal Triangle of the Circumcenter of the Tangential Triangle.

The Outer Fermat Triangle is perspective with the Antipedal Triangle of the Orthocenter of the Anticomplementary Triangle.

The Outer Fermat Triangle is homothetic to the Antipedal Triangle of the Outer Napoleon Point of the Anticomplementary Triangle.

The Outer Fermat Triangle is perspective with the Circumcevian Triangle of the Second Isodynamic Point of the Excentral Triangle.

The Outer Fermat Triangle is perspective with the Circumcevian Triangle of the Inner Fermat Point of the Anticomplementary Triangle.

The Outer Fermat Triangle is perspective with the Euler Triangle of the Excentral Triangle.

The Outer Fermat Triangle is perspective with the First Brocard Triangle of the Anticomplementary Triangle.

The Outer Fermat Triangle is perspective with the Neuberg Triangle of the Anticomplementary Triangle.

The Outer Fermat Triangle is perspective with the Reflected Neuberg Triangle of the Anticomplementary Triangle.

The Outer Fermat Triangle is perspective with the Inner Fermat Triangle of the Anticomplementary Triangle.

The Outer Fermat Triangle is perspective with the Outer Napoleon Triangle of the Anticomplementary Triangle.

The Outer Fermat Triangle is perspective with the Inner Napoleon Triangle of the Anticomplementary Triangle.

The Outer Fermat Triangle is perspective with the Outer Vecten Triangle of the Anticomplementary Triangle.

The Outer Fermat Triangle is perspective with the Inner Vecten Triangle of the Anticomplementary Triangle.

The Outer Fermat Triangle is perspective with the Cevian Triangle of the Circumcenter of the Circum-Incentral Triangle.

The Outer Fermat Triangle is perspective with the Anticevian Triangle of the Circumcenter of the Circum-Incentral Triangle.

The Outer Fermat Triangle is perspective with the Circumcevian Triangle of the Circumcenter of the Circum-Incentral Triangle.

The Outer Fermat Triangle is perspective with the Lucas Central Triangle of the Circum-Incentral Triangle.

The Outer Fermat Triangle is perspective with the Medial Triangle of the First Brocard Triangle.

The Outer Fermat Triangle is perspective with the Medial Triangle of the Neuberg Triangle.

The Outer Fermat Triangle is perspective with the Medial Triangle of the Reflected Neuberg Triangle.

The Outer Fermat Triangle is perspective with the Medial Triangle of the Hexyl Triangle.

The Outer Fermat Triangle is perspective with the Orthic Triangle of the Johnson Triangle.

The Outer Fermat Triangle is perspective with the Anticomplementary Triangle of the Euler Triangle.

The Outer Fermat Triangle is perspective with the Anticomplementary Triangle of the First Brocard Triangle.

The Outer Fermat Triangle is perspective with the Anticevian Triangle of the Gergonne Point of the Lucas Central Triangle.

The Outer Fermat Triangle is perspective with the Anticomplementary Triangle of the

Neuberg Triangle.

The Outer Fermat Triangle is perspective with the Anticomplementary Triangle of the Reflected Neuberg Triangle.

The Outer Fermat Triangle is perspective with the Anticevian Triangle of the Orthocenter of the Johnson Triangle.

The Outer Fermat Triangle is perspective with the First Brocard Triangle of the First Brocard Triangle.

The Outer Fermat Triangle is perspective with the Neuberg Triangle of the First Brocard Triangle.

The Outer Fermat Triangle is perspective with the Reflected Neuberg Triangle of the First Brocard Triangle.

The Outer Fermat Triangle is perspective with the First Brocard Triangle of the Neuberg Triangle.

The Outer Fermat Triangle is perspective with the Neuberg Triangle of the Neuberg Triangle.

The Outer Fermat Triangle is perspective with the Reflected Neuberg Triangle of the Neuberg Triangle.

The Outer Fermat Triangle is perspective with the First Brocard Triangle of the Reflected Neuberg Triangle.

The Outer Fermat Triangle is perspective with the Neuberg Triangle of the Reflected Neuberg Triangle.

The Outer Fermat Triangle is perspective with the Reflected Neuberg Triangle of the Reflected Neuberg Triangle.

The Outer Fermat Triangle is perspective with the Euler Triangle of the Hexyl Triangle.

The Outer Fermat Triangle is perspective with the Johnson Triangle of the Hexyl Triangle.

The Outer Fermat Triangle is perspective with the Euler Triangle of the Johnson Triangle.

The Outer Fermat Triangle is perspective with the Reflection Triangle of the Johnson Triangle.

The Outer Fermat Triangle is perspective with the Pedal Triangle of the de Longchamps Point of the Euler Triangle.

The Outer Fermat Triangle is perspective with the Pedal Triangle of the Circumcenter of the First Brocard Triangle.

The Outer Fermat Triangle is perspective with the Pedal Triangle of the Circumcenter of the Neuberg Triangle.

The Outer Fermat Triangle is perspective with the Pedal Triangle of the Circumcenter of the Reflected Neuberg Triangle.

The Outer Fermat Triangle is perspective with the Pedal Triangle of the Circumcenter of the Hexyl Triangle.

The Outer Fermat Triangle is perspective with the Pedal Triangle of the Orthocenter of the Johnson Triangle.

The Outer Fermat Triangle is perspective with the Antipedal Triangle of the Centroid of the Euler Triangle.

The Outer Fermat Triangle is perspective with the Antipedal Triangle of the Orthocenter of the Euler Triangle.

The Outer Fermat Triangle is homothetic to the Antipedal Triangle of the Outer Napoleon Point of the Euler Triangle.

The Outer Fermat Triangle is perspective with the Antipedal Triangle of the Orthocenter of the First Brocard Triangle.

The Outer Fermat Triangle is perspective with the Antipedal Triangle of the Centroid of the Malfatti Squares Triangle.

The Outer Fermat Triangle is perspective with the Antipedal Triangle of the Orthocenter of the Neuberg Triangle.

The Outer Fermat Triangle is perspective with the Antipedal Triangle of the Orthocenter of the Reflected Neuberg Triangle.

The Outer Fermat Triangle is homothetic to the Antipedal Triangle of the Outer Napoleon Point of the Johnson Triangle.

The Outer Fermat Triangle is perspective with the Antipedal Triangle of the de Longchamps Point of the Johnson Triangle.

The Outer Fermat Triangle is homothetic to the Antipedal Triangle of the Outer Napoleon Point of the Inner Johnson-Yff Triangle.

The Outer Fermat Triangle is homothetic to the Antipedal Triangle of the Outer Napoleon Point of the Outer Johnson-Yff Triangle.

The Outer Fermat Triangle is perspective with the Circumcevian Triangle of the Circumcenter of the Euler Triangle.

The Outer Fermat Triangle is perspective with the Circumcevian Triangle of the

Circumcenter of the Malfatti Squares Triangle.

The Outer Fermat Triangle is perspective with the Circum-Orthic Triangle of the Johnson Triangle.

The Outer Fermat Triangle is homothetic to the Outer Fermat Triangle of the Euler Triangle.

The Outer Fermat Triangle is perspective with the Outer Fermat Triangle of the First Brocard Triangle.

The Outer Fermat Triangle is perspective with the Inner Fermat Triangle of the First Brocard Triangle.

The Outer Fermat Triangle is perspective with the Outer Napoleon Triangle of the First Brocard Triangle.

The Outer Fermat Triangle is perspective with the Inner Napoleon Triangle of the First Brocard Triangle.

The Outer Fermat Triangle is perspective with the Outer Vecten Triangle of the First Brocard Triangle.

The Outer Fermat Triangle is perspective with the Inner Vecten Triangle of the First Brocard Triangle.

The Outer Fermat Triangle is perspective with the Outer Fermat Triangle of the Neuberg Triangle.

The Outer Fermat Triangle is perspective with the Inner Fermat Triangle of the Neuberg Triangle.

The Outer Fermat Triangle is perspective with the Outer Napoleon Triangle of the Neuberg Triangle.

The Outer Fermat Triangle is perspective with the Inner Napoleon Triangle of the Neuberg Triangle.

The Outer Fermat Triangle is perspective with the Outer Vecten Triangle of the Neuberg Triangle.

The Outer Fermat Triangle is perspective with the Inner Vecten Triangle of the Neuberg Triangle.

The Outer Fermat Triangle is perspective with the Outer Fermat Triangle of the Reflected Neuberg Triangle.

The Outer Fermat Triangle is perspective with the Inner Fermat Triangle of the Reflected Neuberg Triangle.

The Outer Fermat Triangle is perspective with the Outer Napoleon Triangle of the Reflected

Neuberg Triangle.

The Outer Fermat Triangle is perspective with the Inner Napoleon Triangle of the Reflected Neuberg Triangle.

The Outer Fermat Triangle is perspective with the Outer Vecten Triangle of the Reflected Neuberg Triangle.

The Outer Fermat Triangle is perspective with the Inner Vecten Triangle of the Reflected Neuberg Triangle.

The Outer Fermat Triangle is homothetic to the Outer Fermat Triangle of the Johnson Triangle.

The Outer Fermat Triangle is homothetic to the Outer Fermat Triangle of the Inner Johnson-Yff Triangle.

The Outer Fermat Triangle is homothetic to the Outer Fermat Triangle of the Outer Johnson-Yff Triangle.

The Outer Fermat Triangle is perspective with the Triangle of the Circumcenters of the Triangulation Triangles of the Incenter.

The Outer Fermat Triangle is perspective with the Triangle of the Outer Fermat Points of the Triangulation Triangles of the Incenter.

The Outer Fermat Triangle is perspective with the Triangle of the Centroids of the Triangulation Triangles of the Centroid.

The Outer Fermat Triangle is perspective with the Triangle of the Circumcenters of the Triangulation Triangles of the Centroid.

The Outer Fermat Triangle is perspective with the Triangle of the Outer Fermat Points of the Triangulation Triangles of the Centroid.

The Outer Fermat Triangle is perspective with the Triangle of the Incenters of the Triangulation Triangles of the Circumcenter.

The Outer Fermat Triangle is perspective with the Stevanovic Triangle of the Centroids of the Triangulation triangles of the Incenter.

The Outer Fermat Triangle is perspective with the Stevanovic Triangle of the Outer Fermat Points of the Triangulation triangles of the Incenter.

The Outer Fermat Triangle is perspective with the Stevanovic Triangle of the Centroids of the Triangulation triangles of the Centroid.

The Outer Fermat Triangle is perspective with the Stevanovic Triangle of the Outer Fermat Points of the Triangulation triangles of the Centroid.

The Outer Fermat Triangle is perspective with the Stevanovic Triangle of the Incenters of the Triangulation triangles of the Circumcenter.

Inner Fermat Triangle

The Inner Fermat Triangle is perspective with Triangle ABC.

The Inner Fermat Triangle is perspective with the Medial Triangle.

The Inner Fermat Triangle is perspective with the Cevian Triangle of the Outer Fermat Point.

The Inner Fermat Triangle is perspective with the Excentral Triangle.

The Inner Fermat Triangle is perspective with the Anticomplementary Triangle.

The Inner Fermat Triangle is perspective with the Tangential Triangle.

The Inner Fermat Triangle is perspective with the Anticevian Triangle of the Second Isodynamic Point.

The Inner Fermat Triangle is perspective with the Anticevian Triangle of the Inner Napoleon Point.

The Inner Fermat Triangle is perspective with the Antipedal Triangle of the Nine-Point Center.

The Inner Fermat Triangle is perspective with the Antipedal Triangle of the Outer Napoleon Point.

The Inner Fermat Triangle is homothetic to the Antipedal Triangle of the Inner Napoleon Point.

The Inner Fermat Triangle is perspective with the Antipedal Triangle of the Kosnita Point.

The Inner Fermat Triangle is perspective with the Circum-Incentral Triangle.

The Inner Fermat Triangle is perspective with the Fuhrmann Triangle.

The Inner Fermat Triangle is perspective with the Reflection Triangle.

The Inner Fermat Triangle is perspective with the First Brocard Triangle.

The Inner Fermat Triangle is perspective with the Neuberg Triangle.

The Inner Fermat Triangle is perspective with the Reflected Neuberg Triangle.

The Inner Fermat Triangle is perspective with the Johnson Triangle.

The Inner Fermat Triangle is perspective with the Outer Fermat Triangle.

The Inner Fermat Triangle is perspective with the Outer Napoleon Triangle.

The Inner Fermat Triangle is perspective with the Inner Napoleon Triangle.

The Inner Fermat Triangle is perspective with the Outer Vecten Triangle.

The Inner Fermat Triangle is perspective with the Inner Vecten Triangle.

The Inner Fermat Triangle is perspective with the Stevanovic Triangle of the Centroids of the Triangulation triangles of the Incenter.

The Inner Fermat Triangle is perspective with the Stevanovic Triangle of the Centroids of the Triangulation triangles of the Centroid.

The Inner Fermat Triangle is perspective with the Stevanovic Triangle of the Incenters of the Triangulation triangles of the Circumcenter.

The Inner Fermat Triangle is perspective with the Stevanovic Triangle of the Centroids of the Triangulation triangles of the Circumcenter.

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.

Thanks

The figures in this note are produced by using the program C.a.R. (Compass and Ruler), an amazing program created by Rene Grothmann. The Grothmann's program is available for download in the Web: [Rene Grothmann's C.a.R.](#). It is free and open source. The reader may verify easily the statements of this paper by using C.a.R. Many thanks to Rene Grothmann for his wonderful program.

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