Hexagonal circular 3-webs with polar curves of degree three

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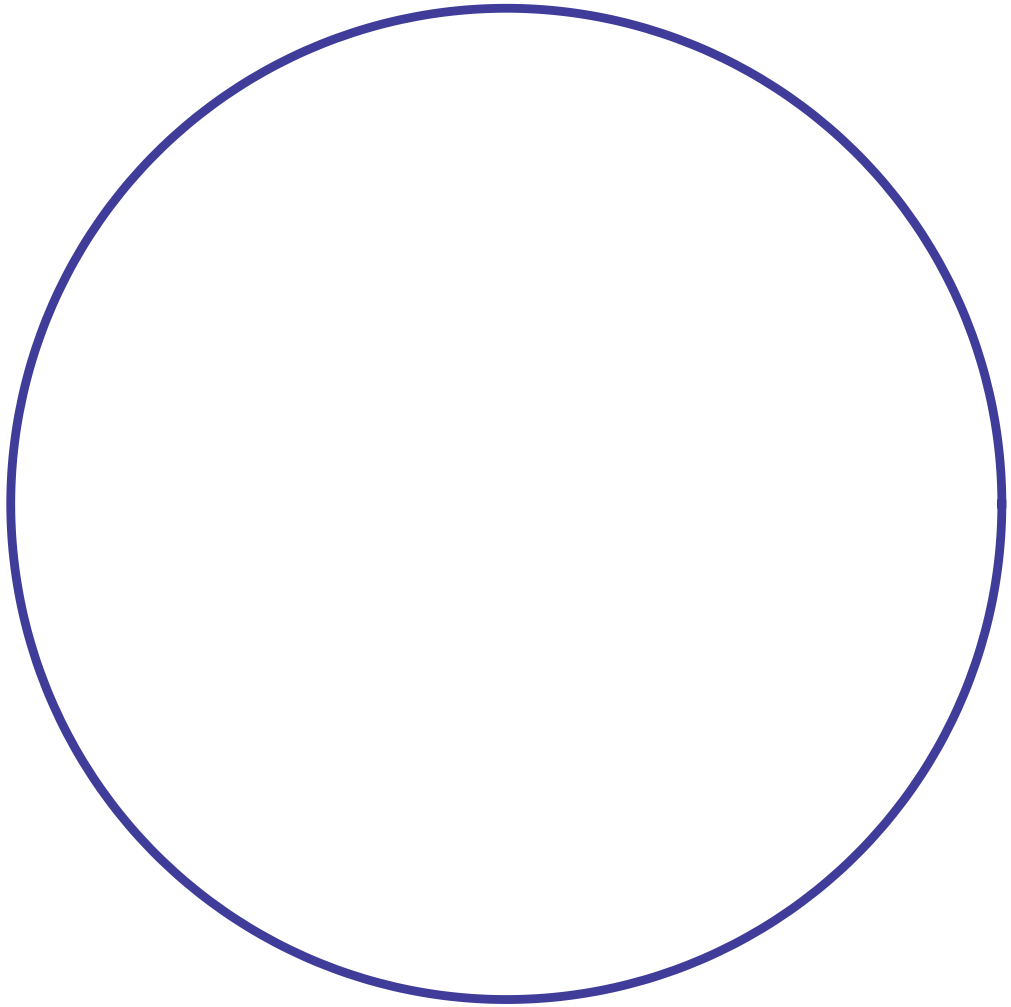
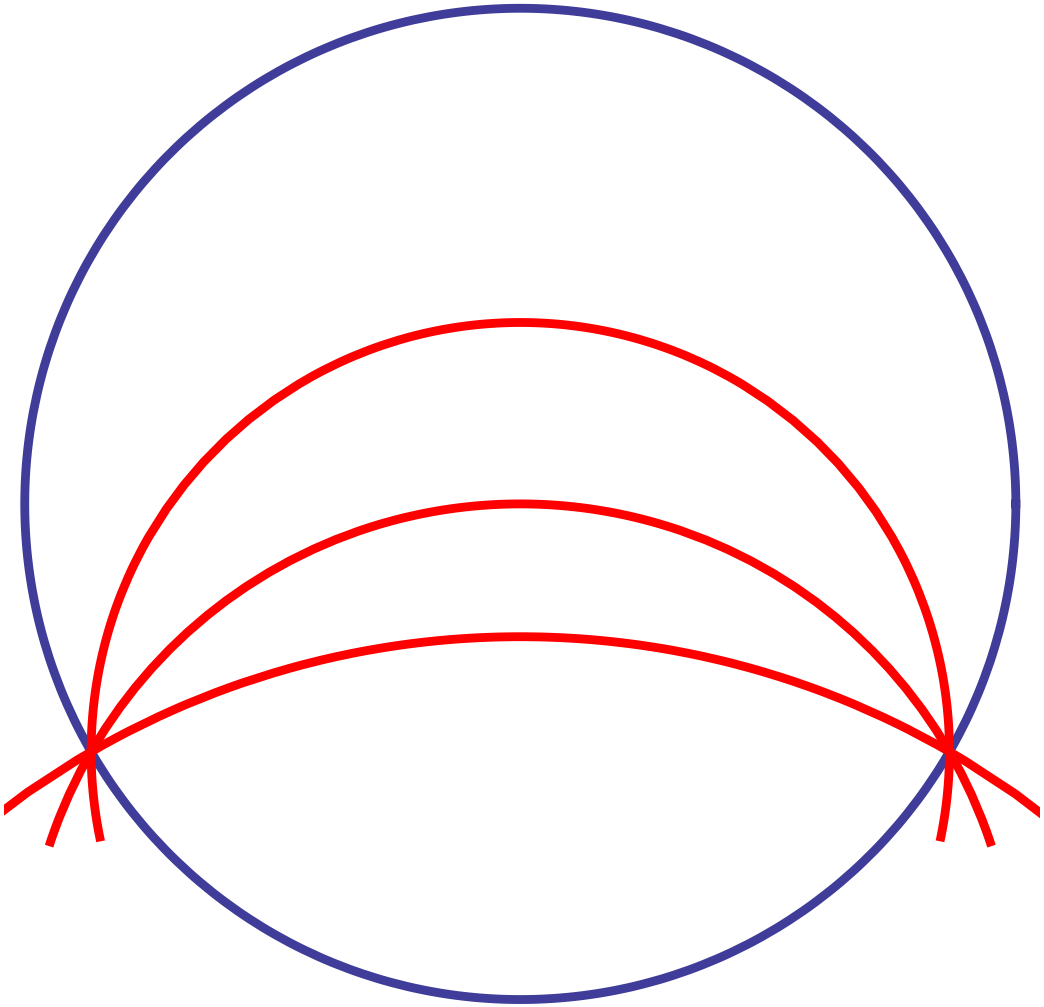
Circular hexagonal 3-webs. Example



Circular hexagonal 3-webs. Example



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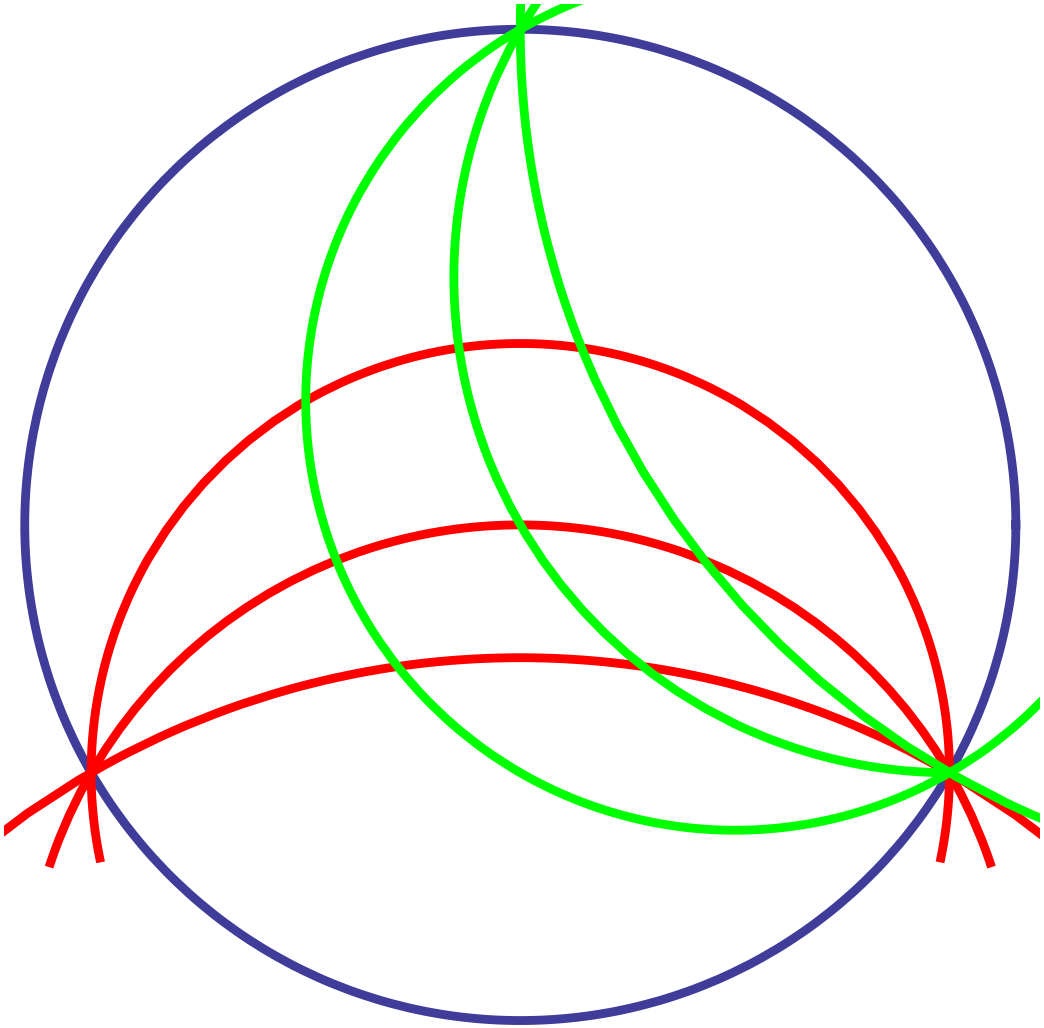

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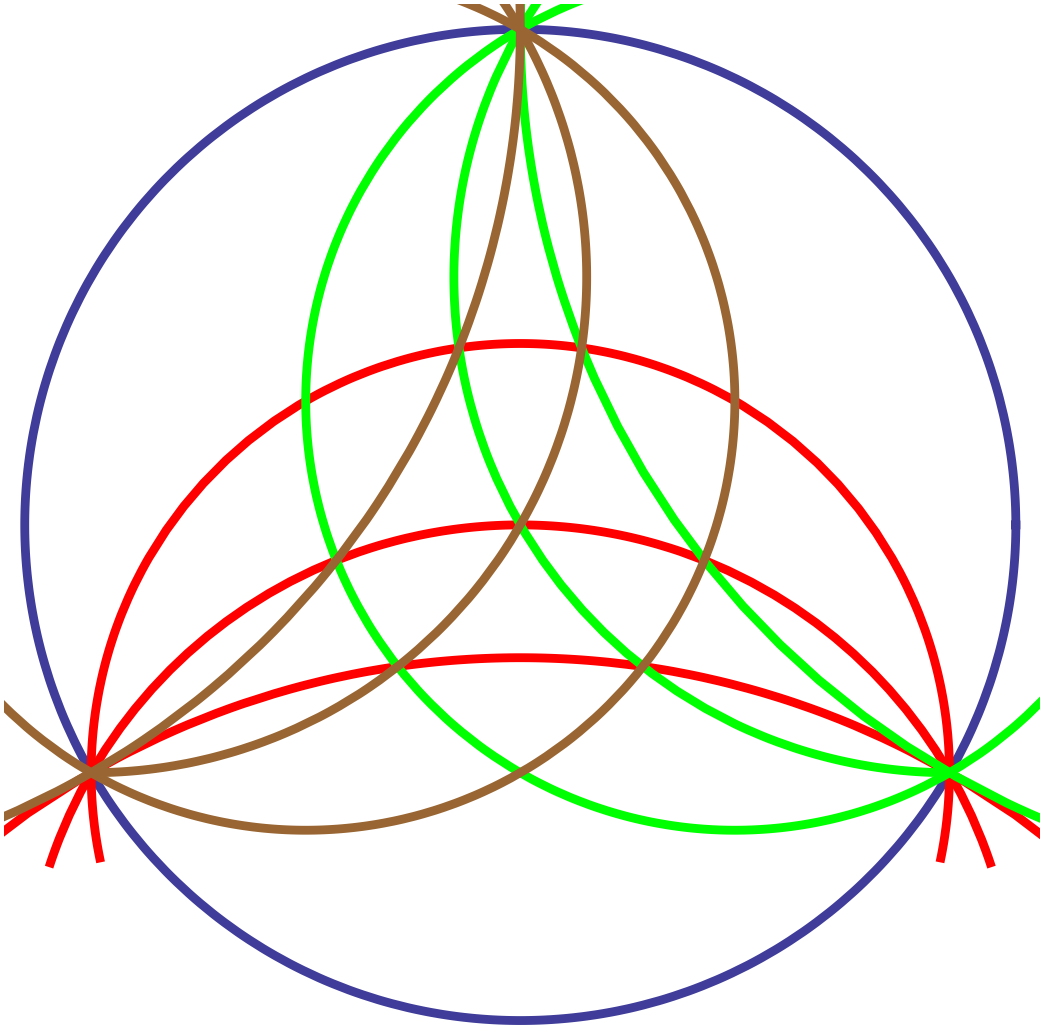

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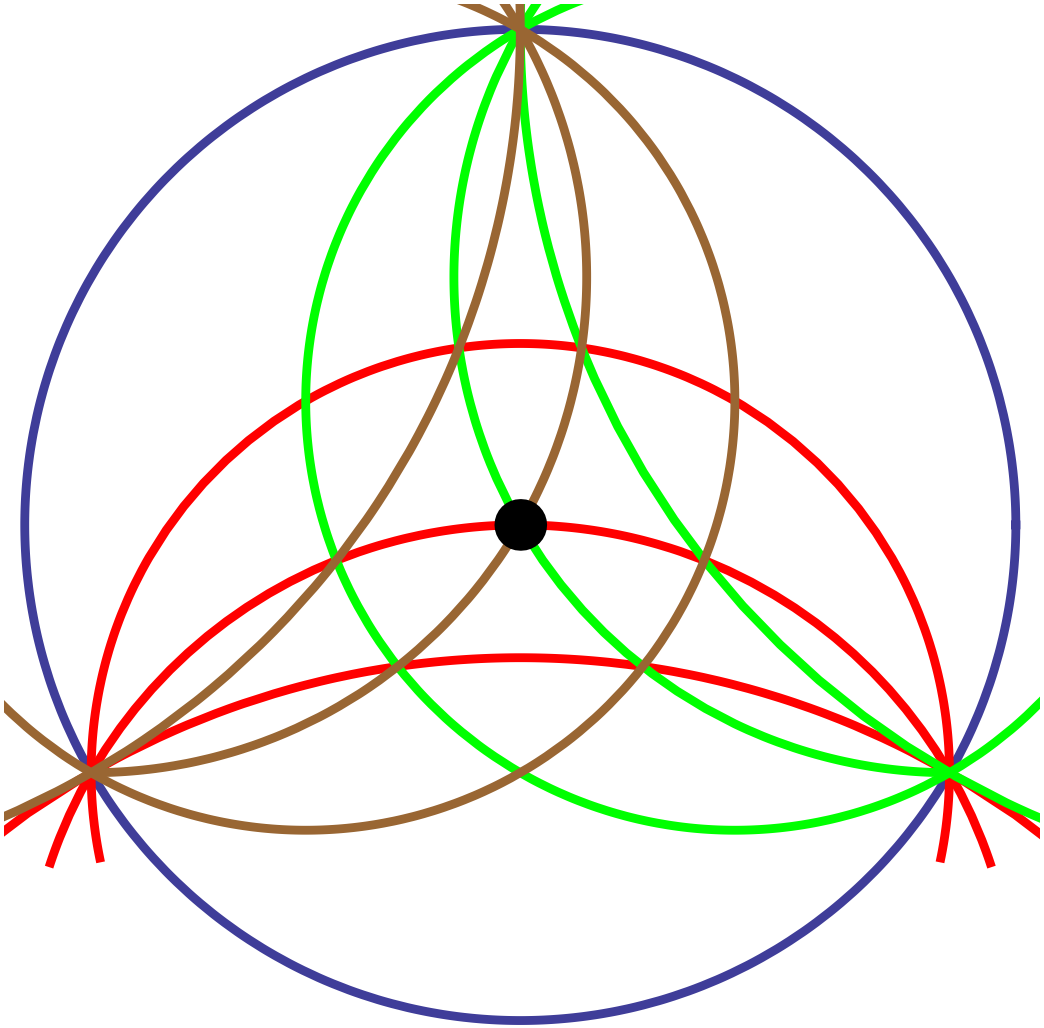

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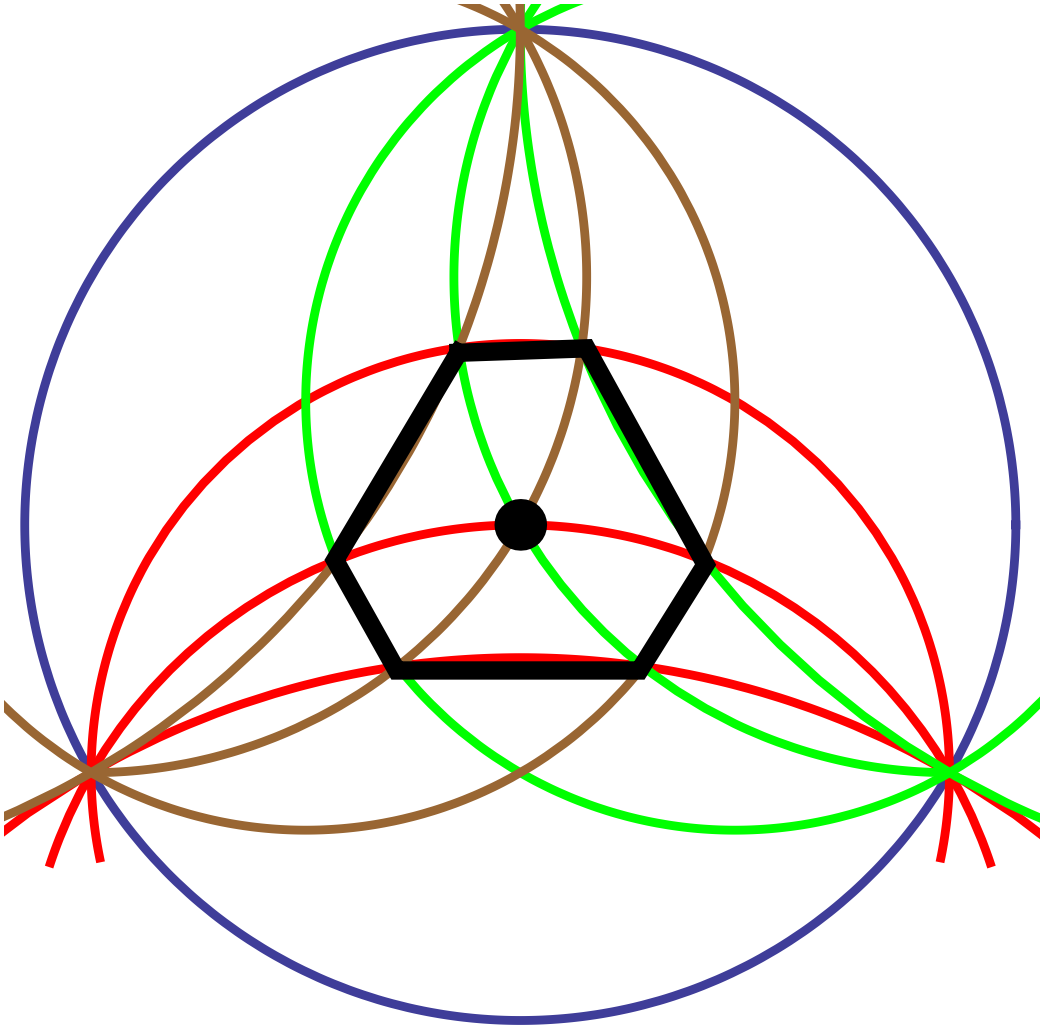

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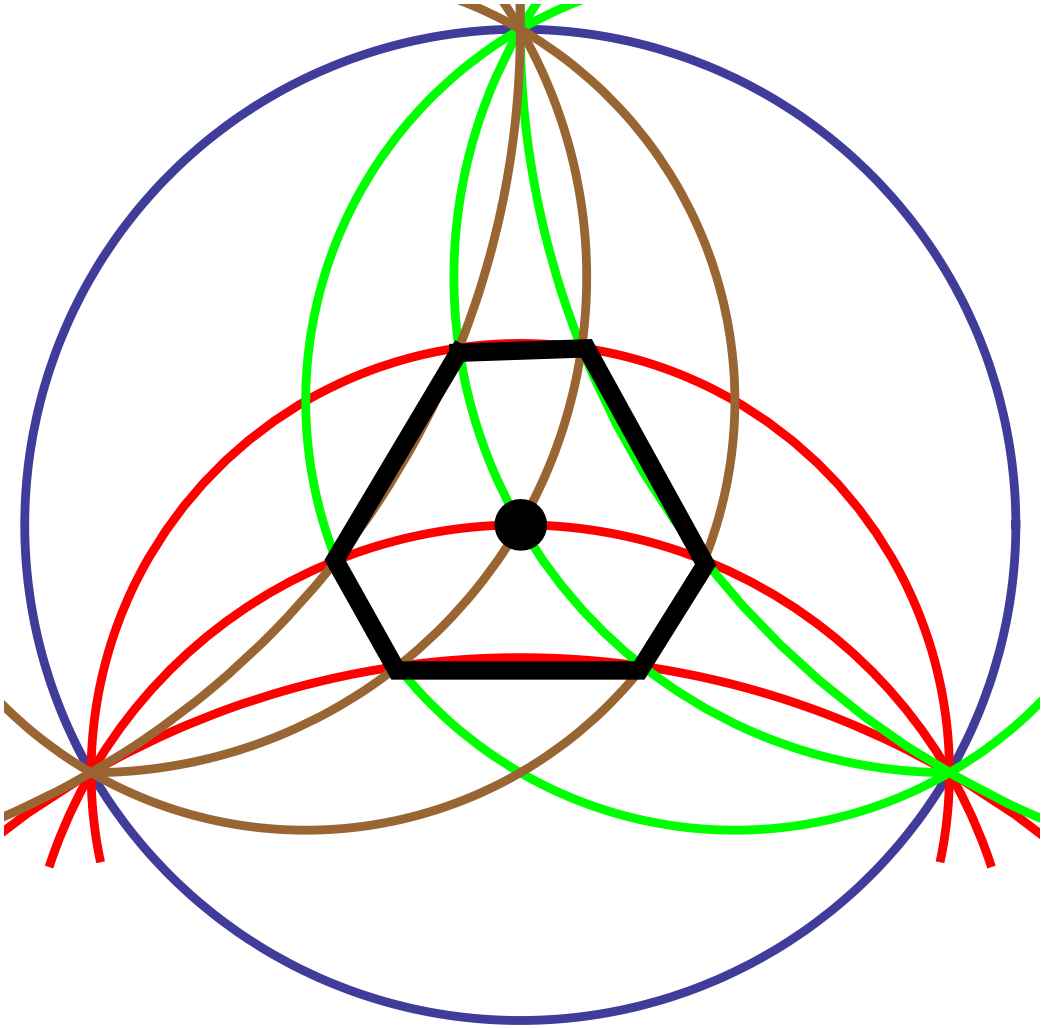


3 elliptic pencils

Twisted Cubic or Line & Conic

Theorem AS '23

There is no hexagonal circular 3-web whose polar curve is a twisted cubic.

Twisted Cubic or Line & Conic

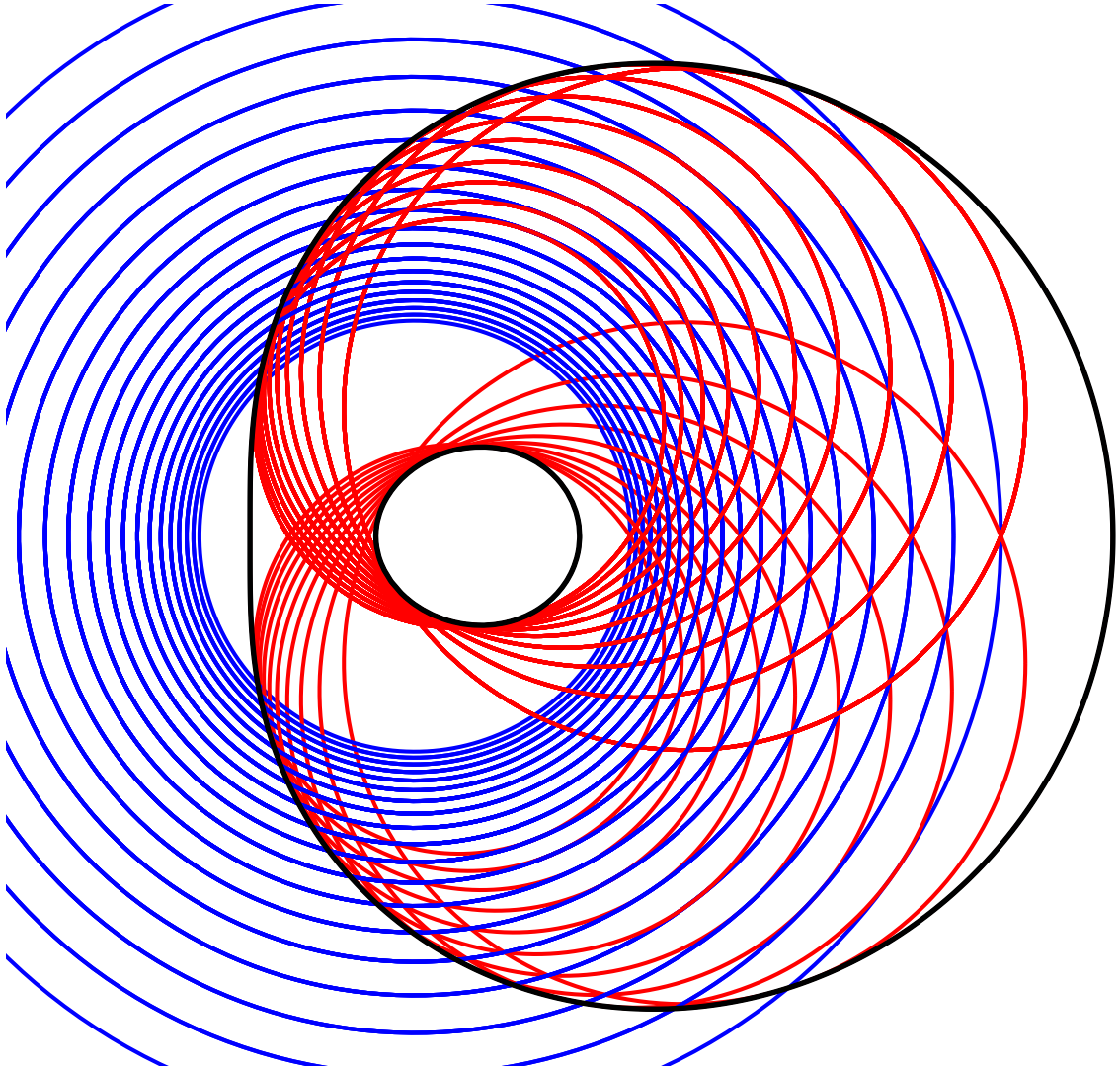
Theorem AS '23

There is no hexagonal circular 3-web whose polar curve is a twisted cubic.

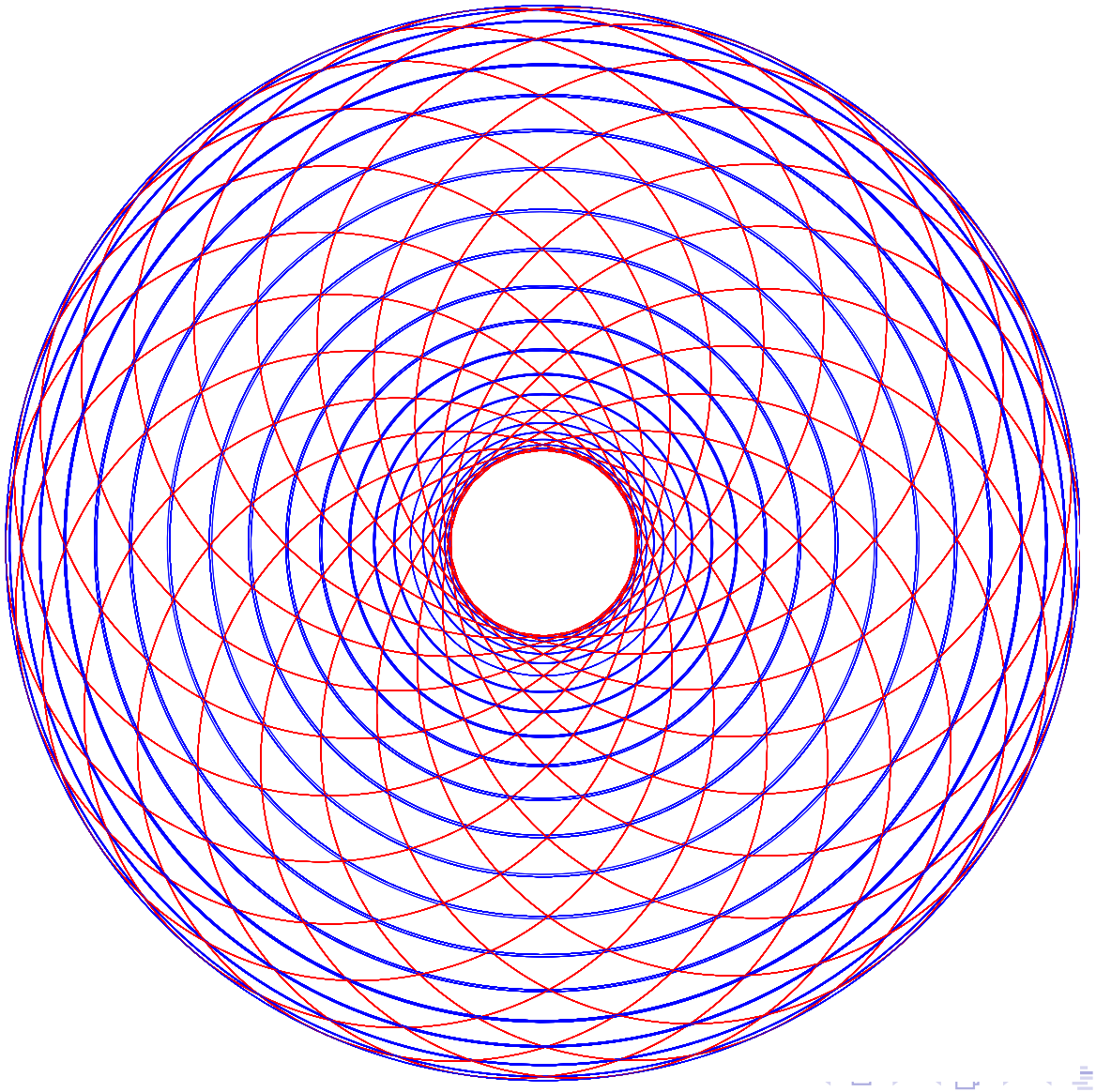
Theorem AS '23

If the polar curve of a hexagonal circular 3-web splits into a smooth conic and a straight line, not lying in a plane of the conic, then the web is Möbius equivalent to exactly one from the following list:

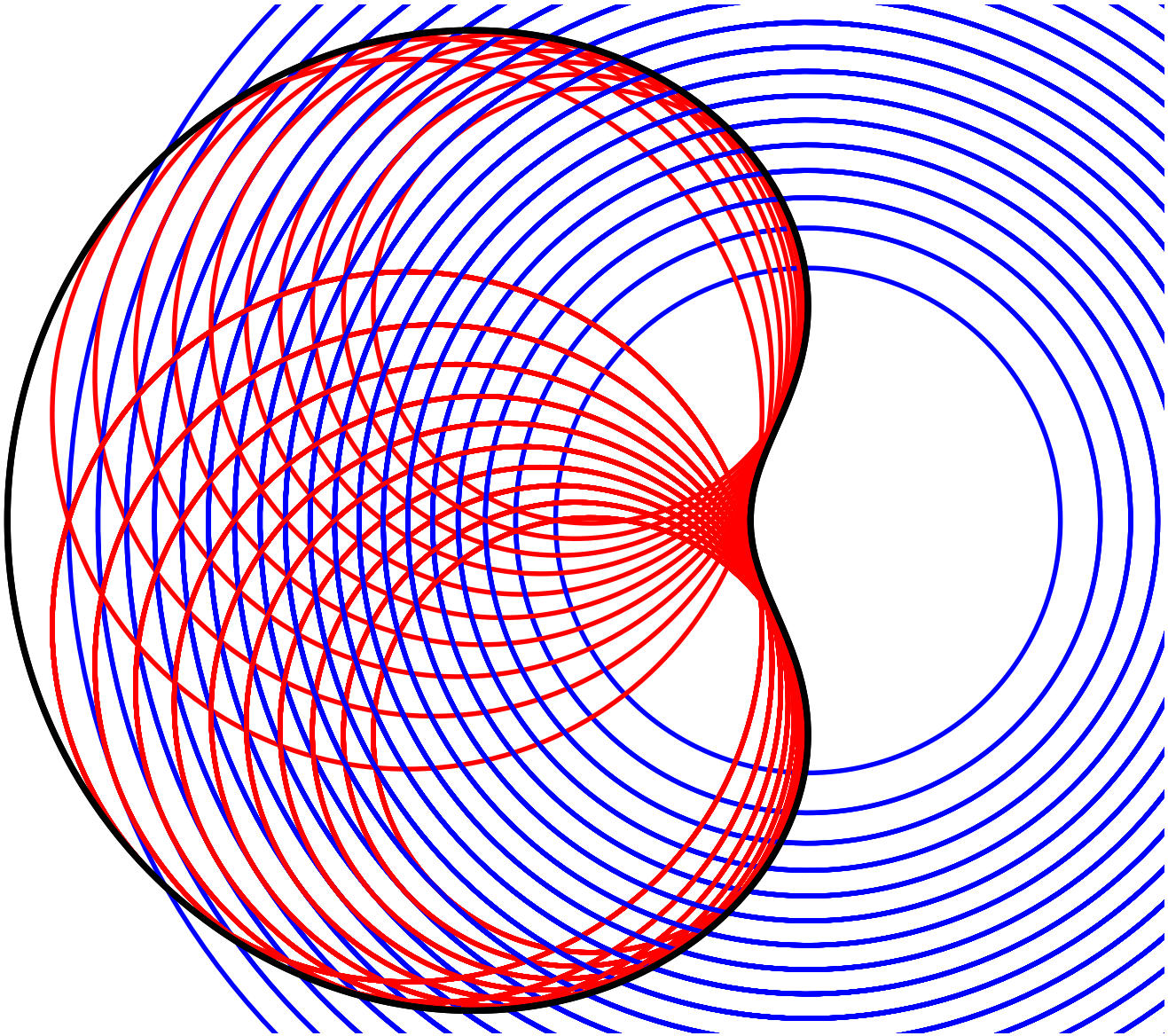
1. Hyperbolic pencil, conic plane misses Darboux quadric



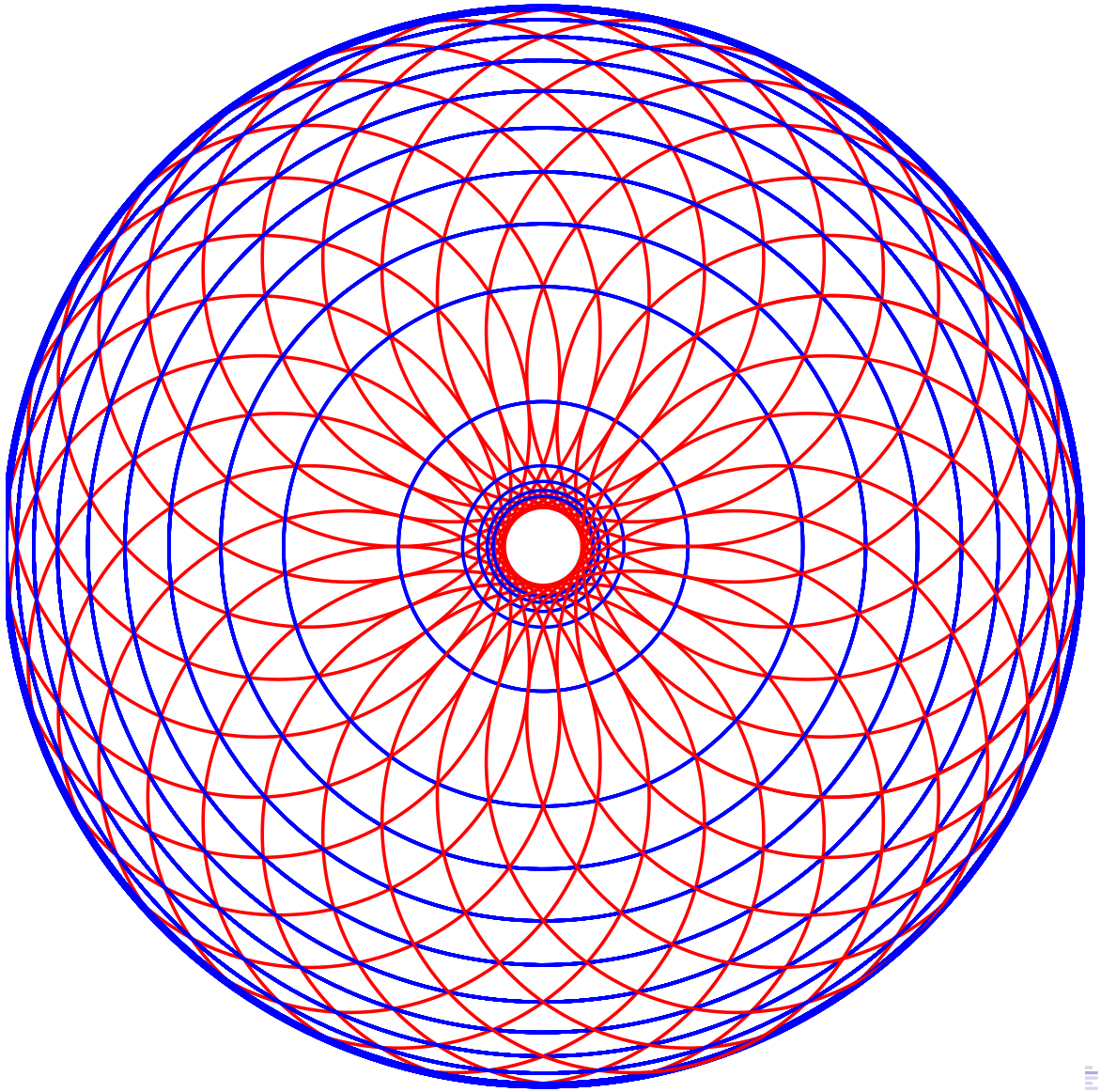
2. Hyperbolic pencil, conic plane misses Darboux quadric, symmetric



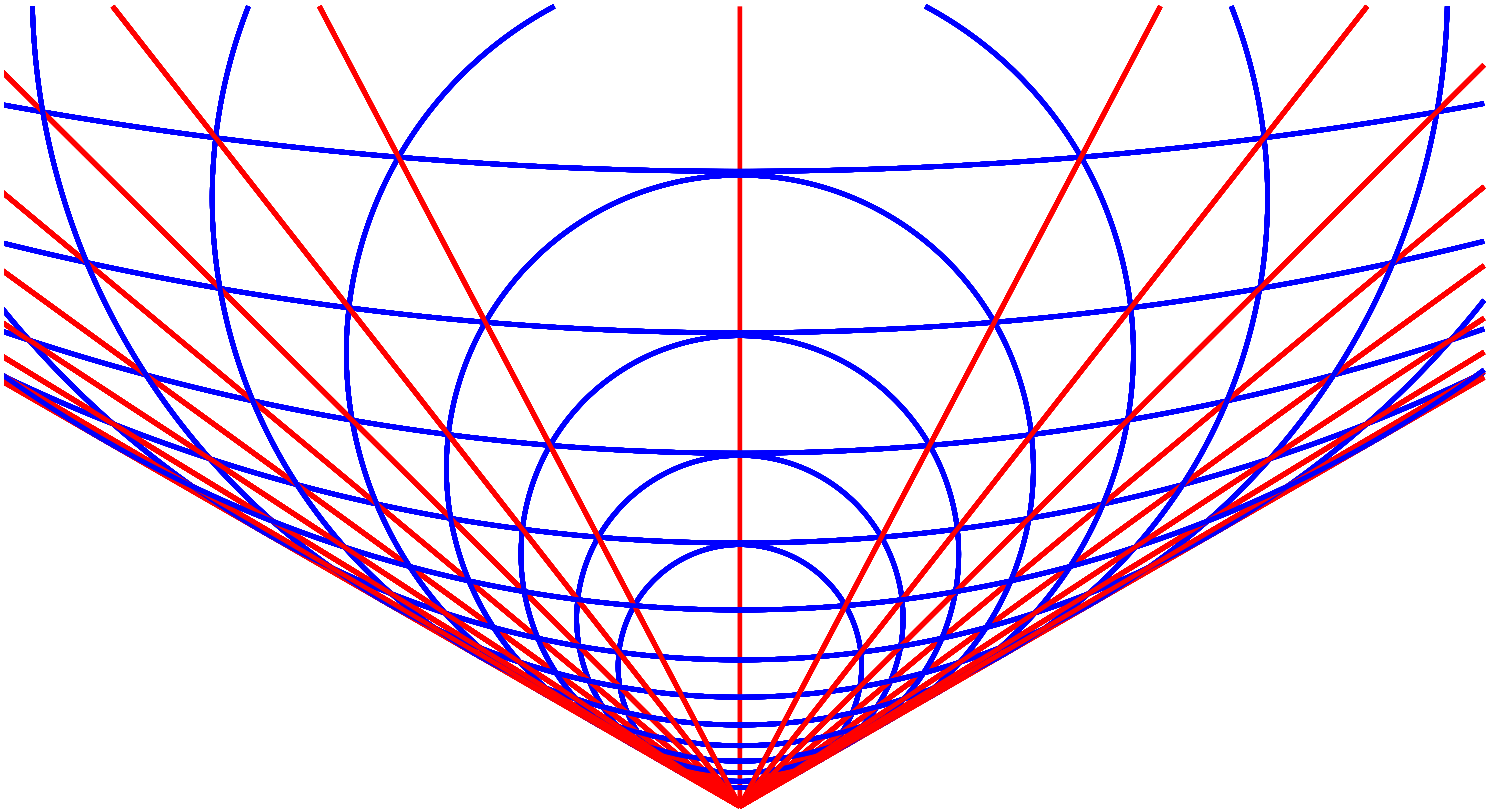
3. Hyperbolic pencil, conic plane cuts Darboux quadric



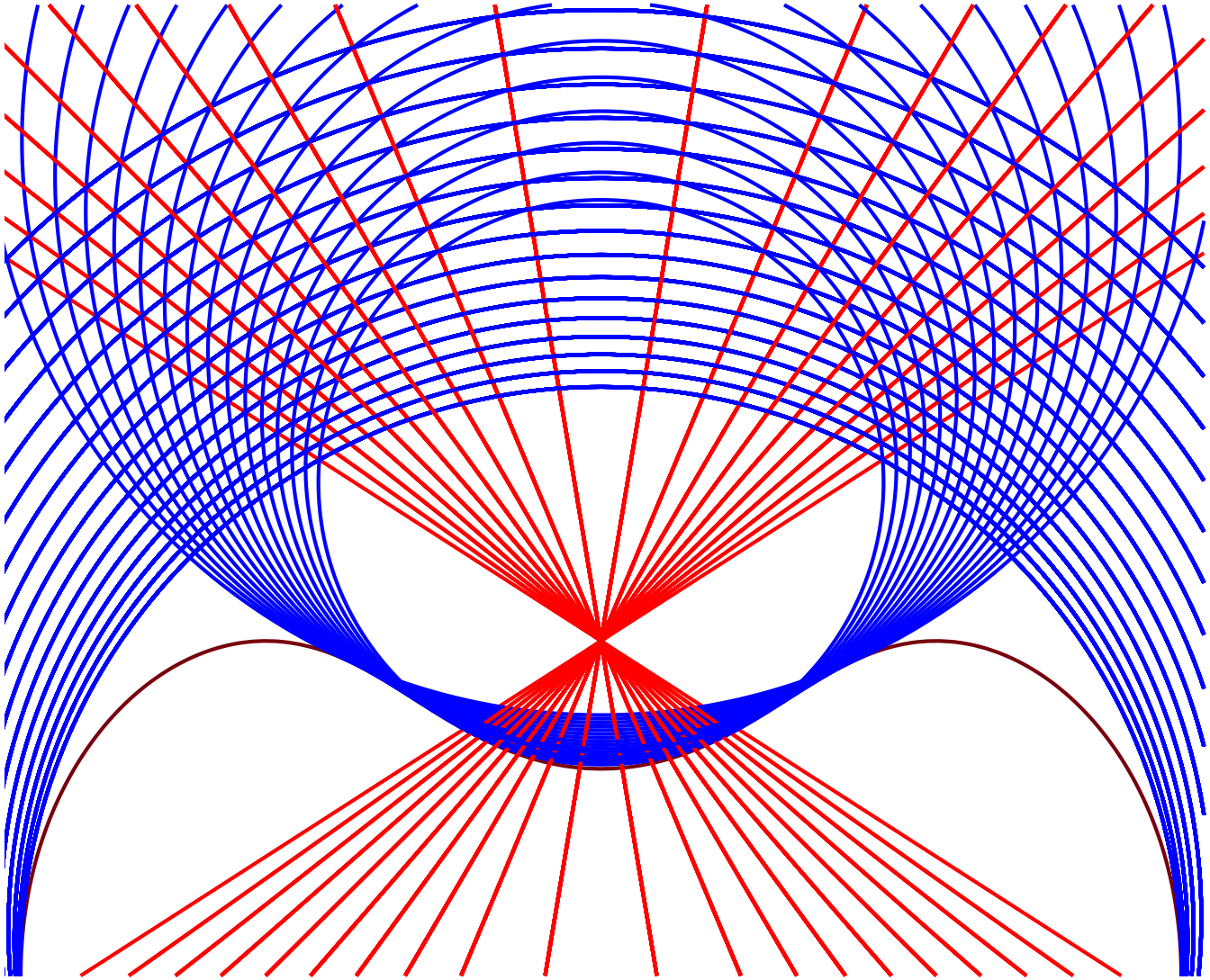
4. Hyperbolic pencil, conic plane cuts Darboux quadric, symmetric



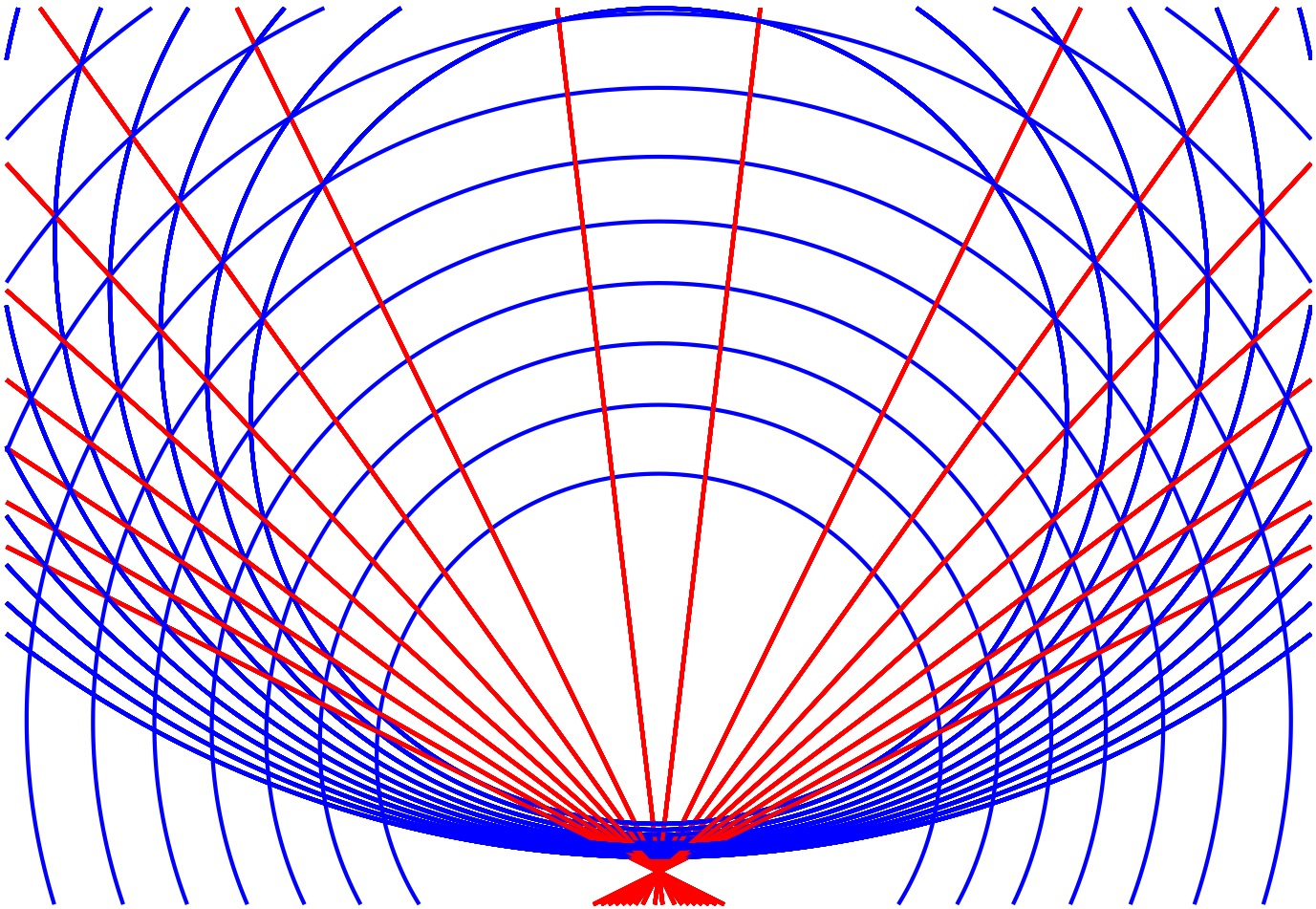
5. Elliptic pencil, conic plane cuts Darboux quadric, symmetric



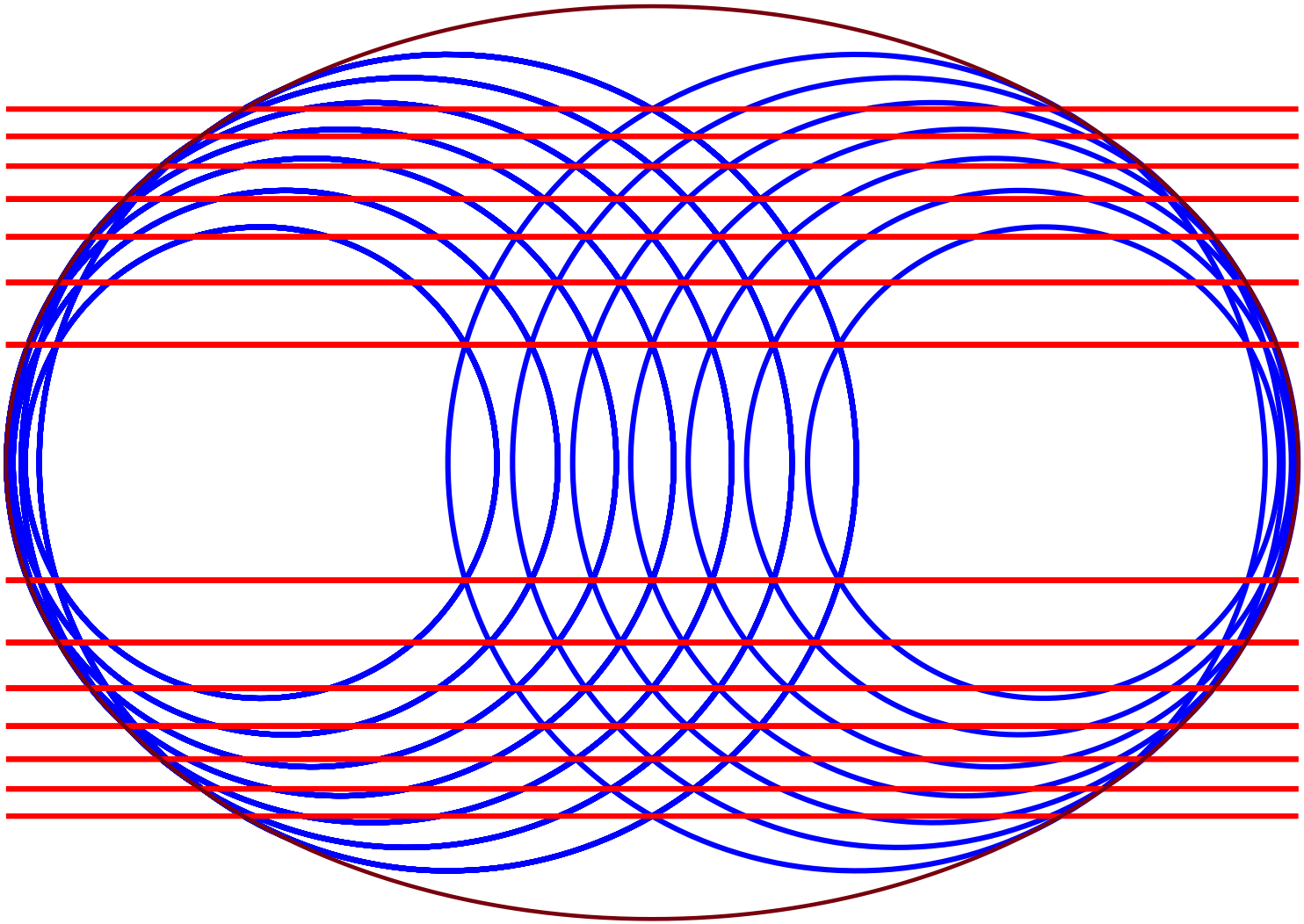
6. Elliptic pencil, conic plane cuts Darboux quadric



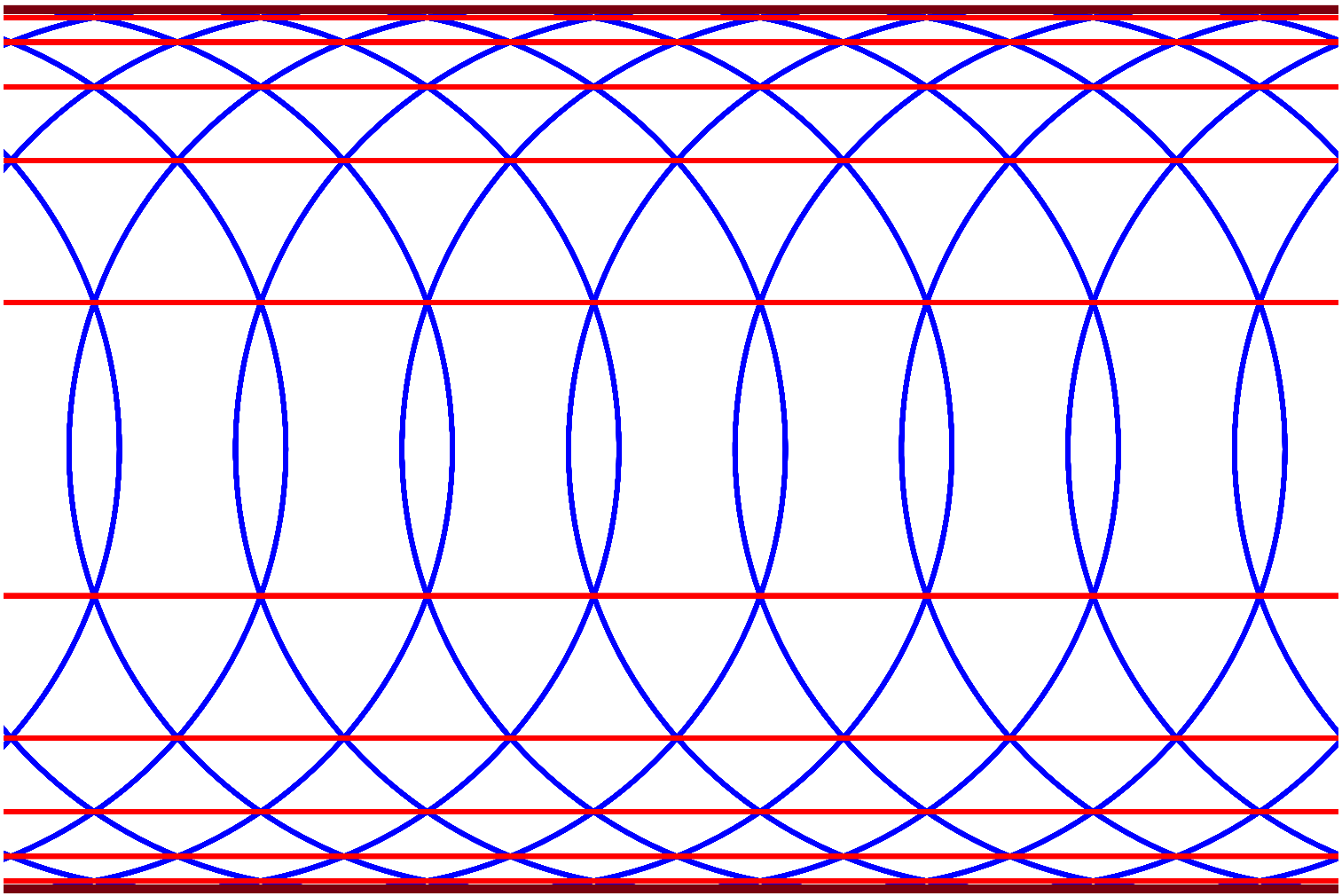
7. Elliptic pencil, conic plane cuts Darboux quadric



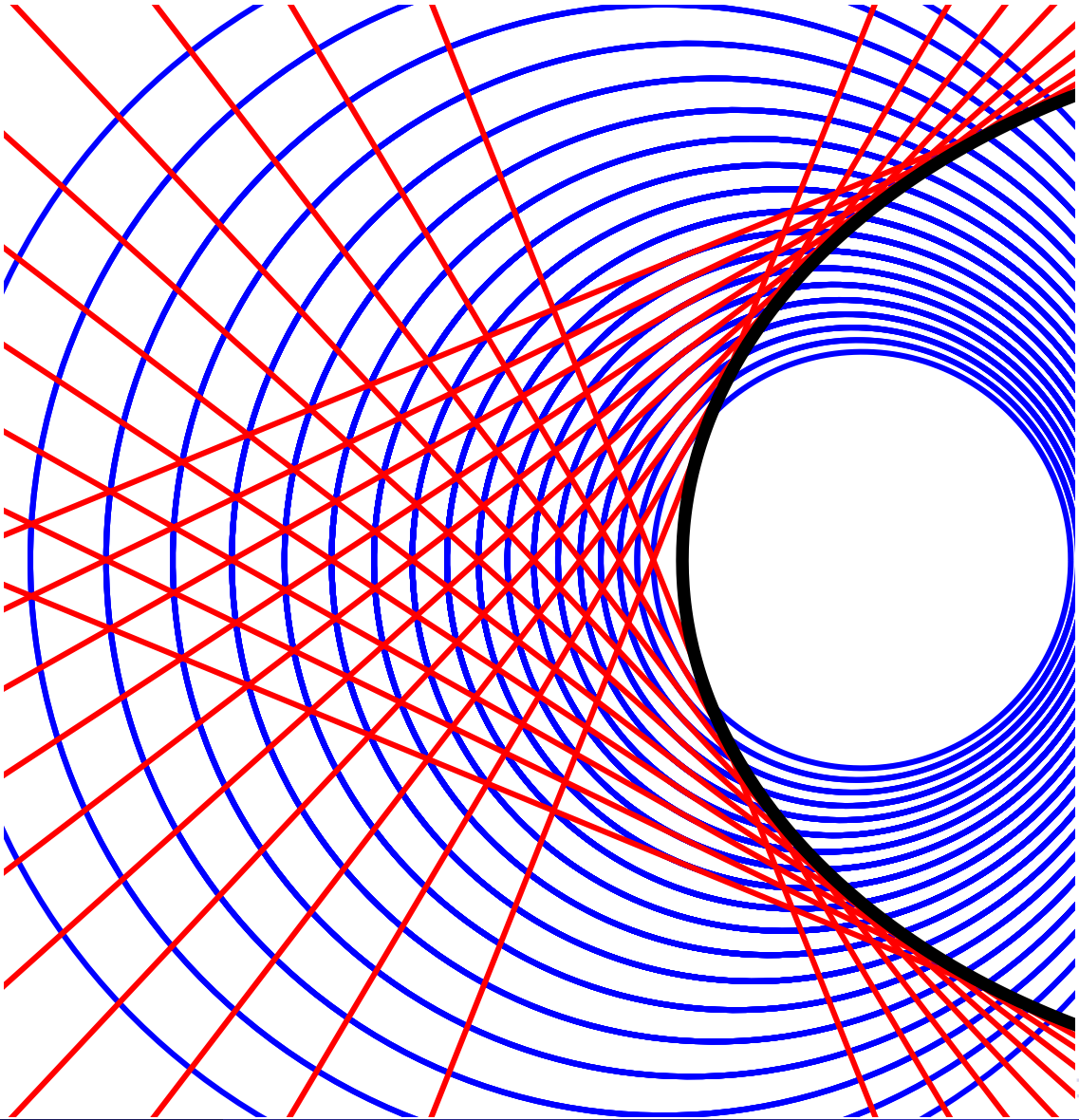
8. Parabolic pencil, conic plane cuts Darboux quadric



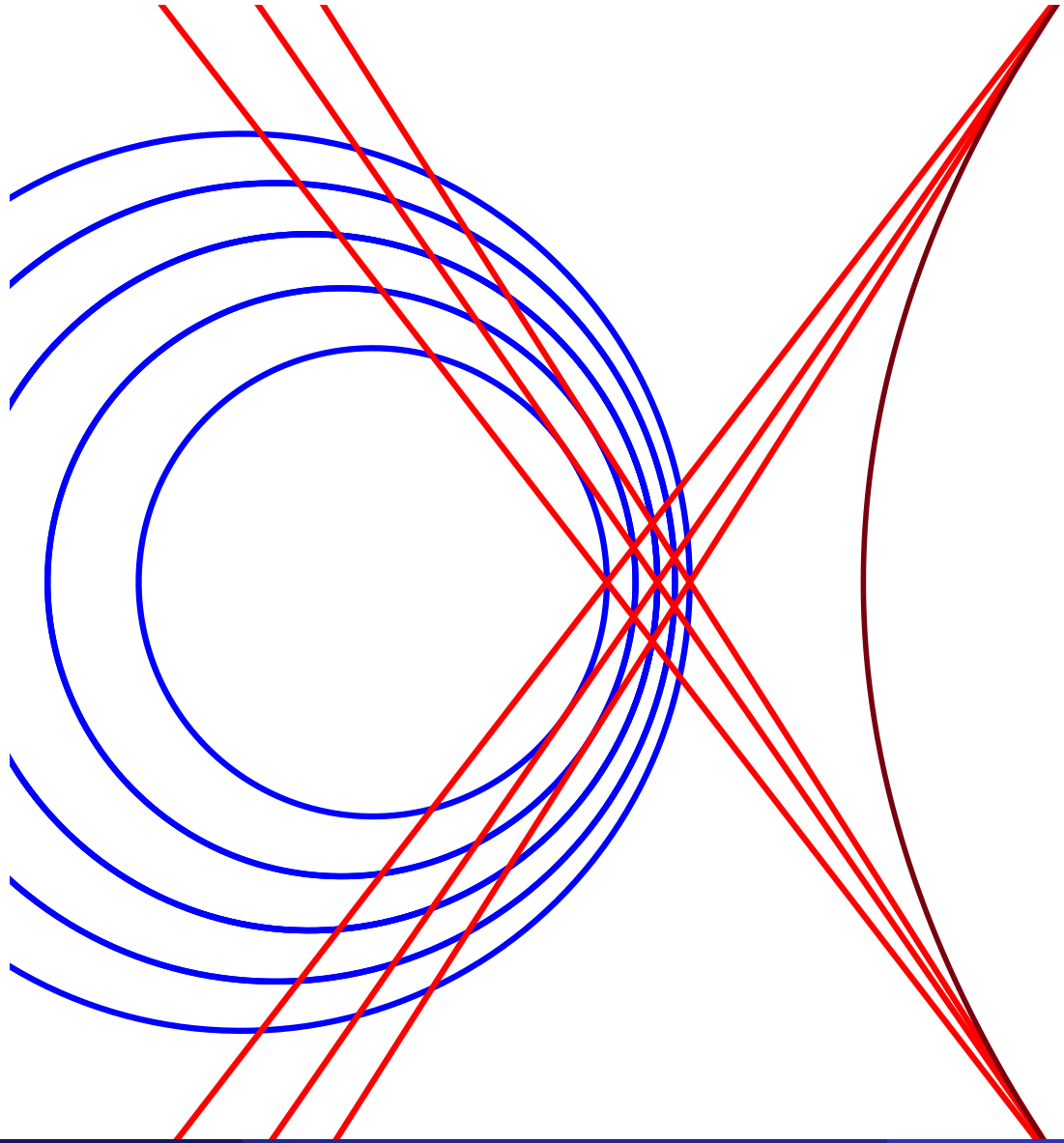
9. Parabolic pencil, conic plane cuts Darboux quadric, symmetric



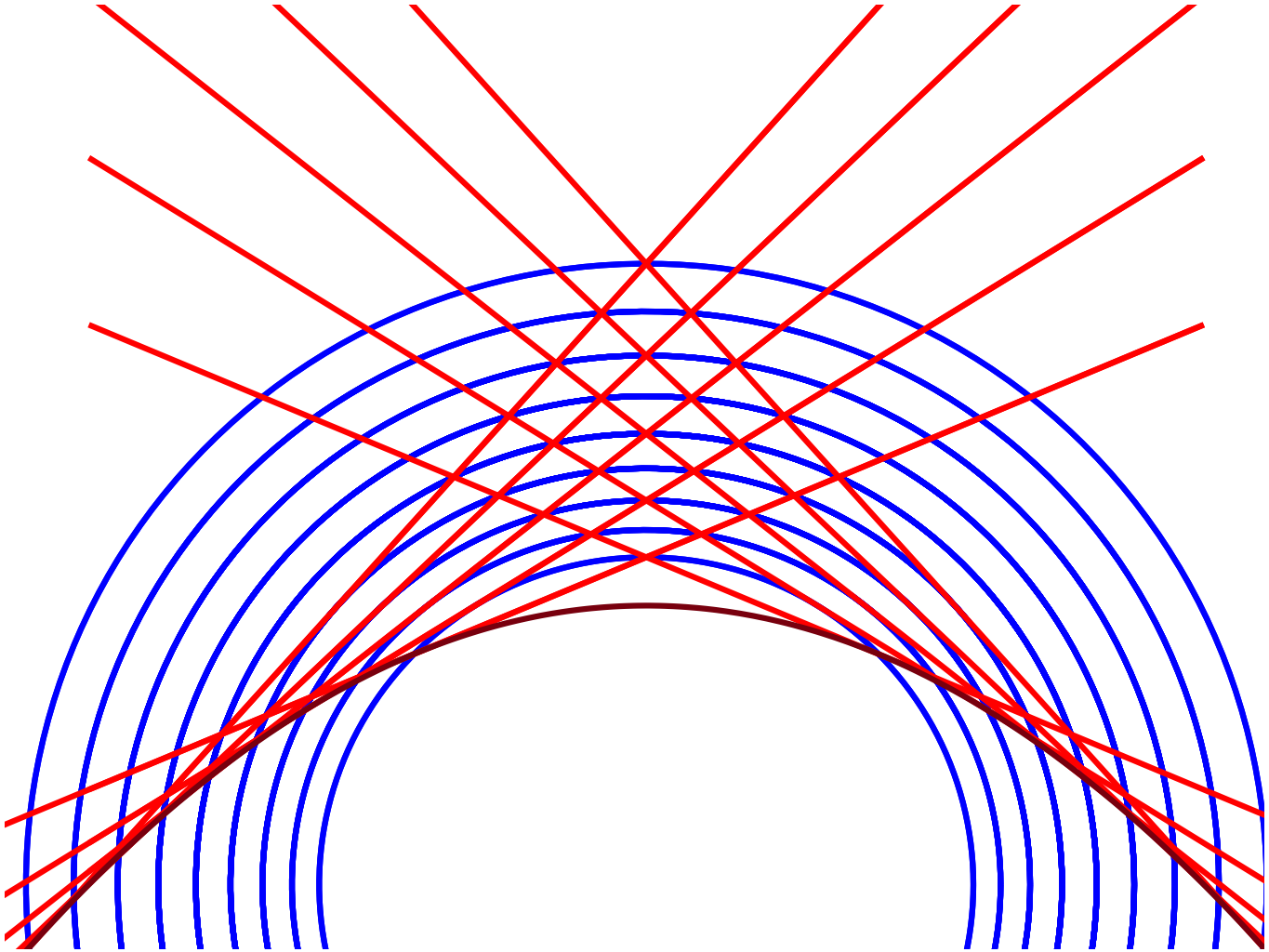
10. Hyperbolic pencil, conic plane touches Darboux quadric



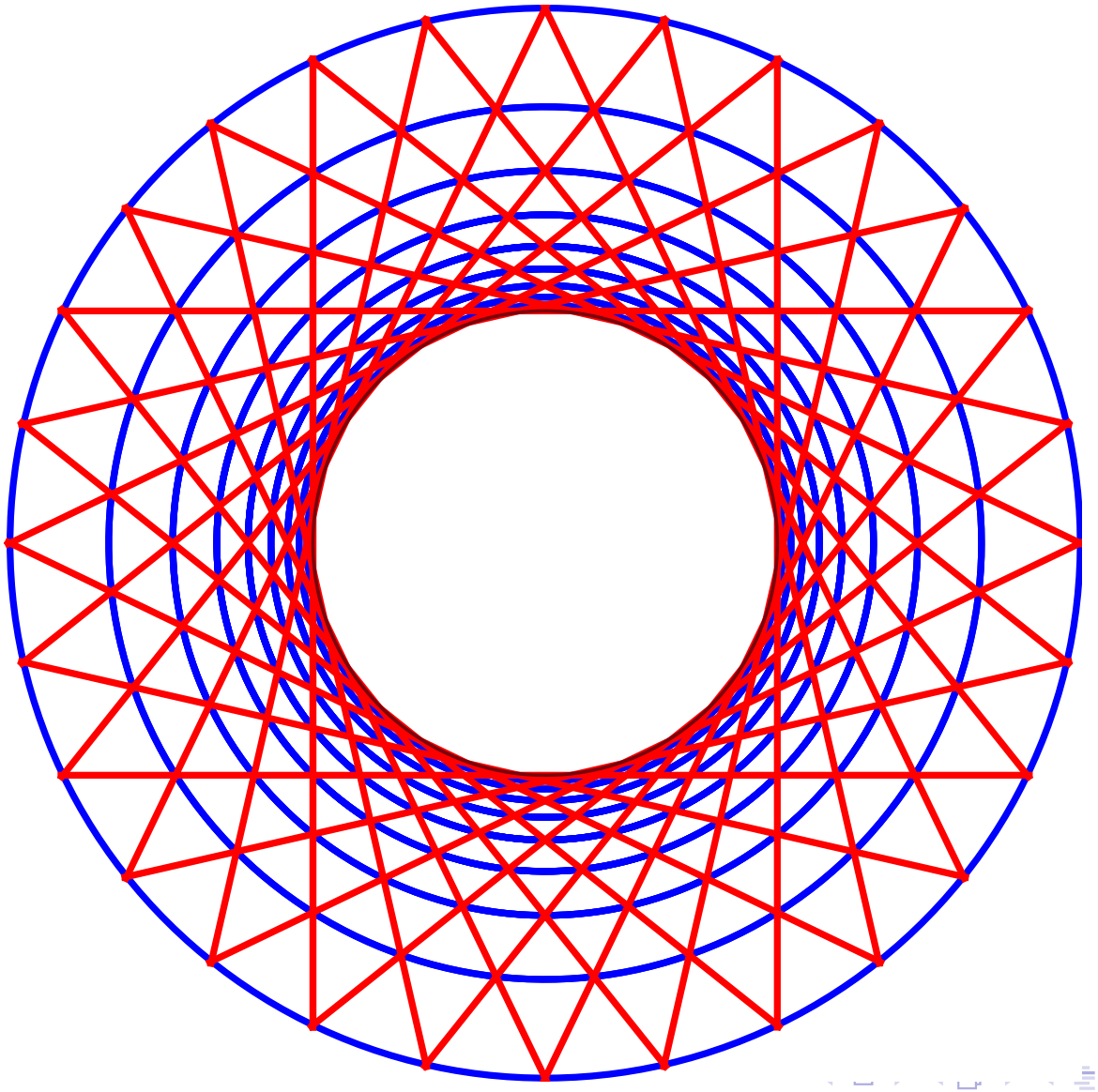
11. Hyperbolic pencil, conic plane touches Darboux quadric



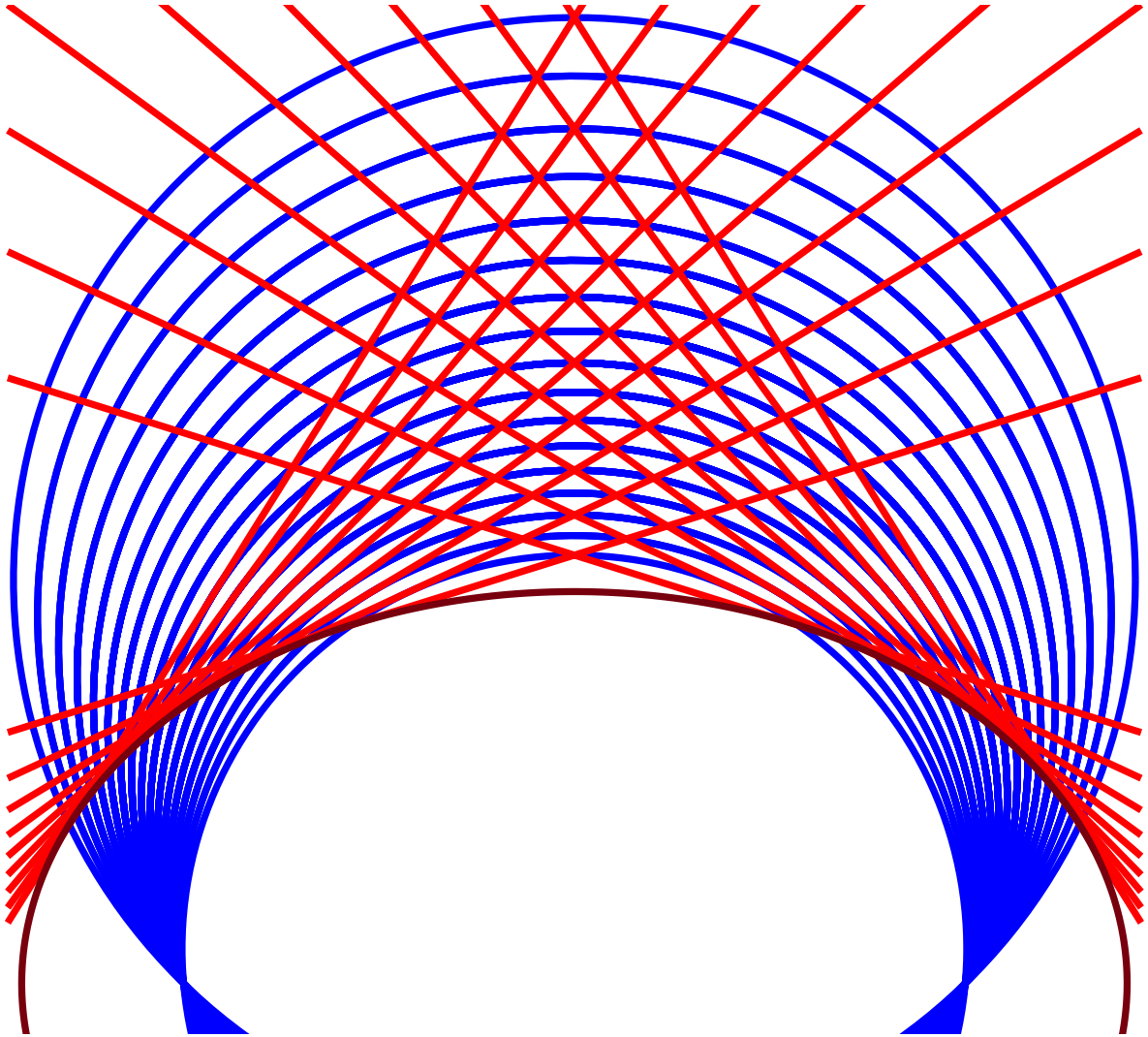
12. Hyperbolic pencil, conic plane touches Darboux quadric



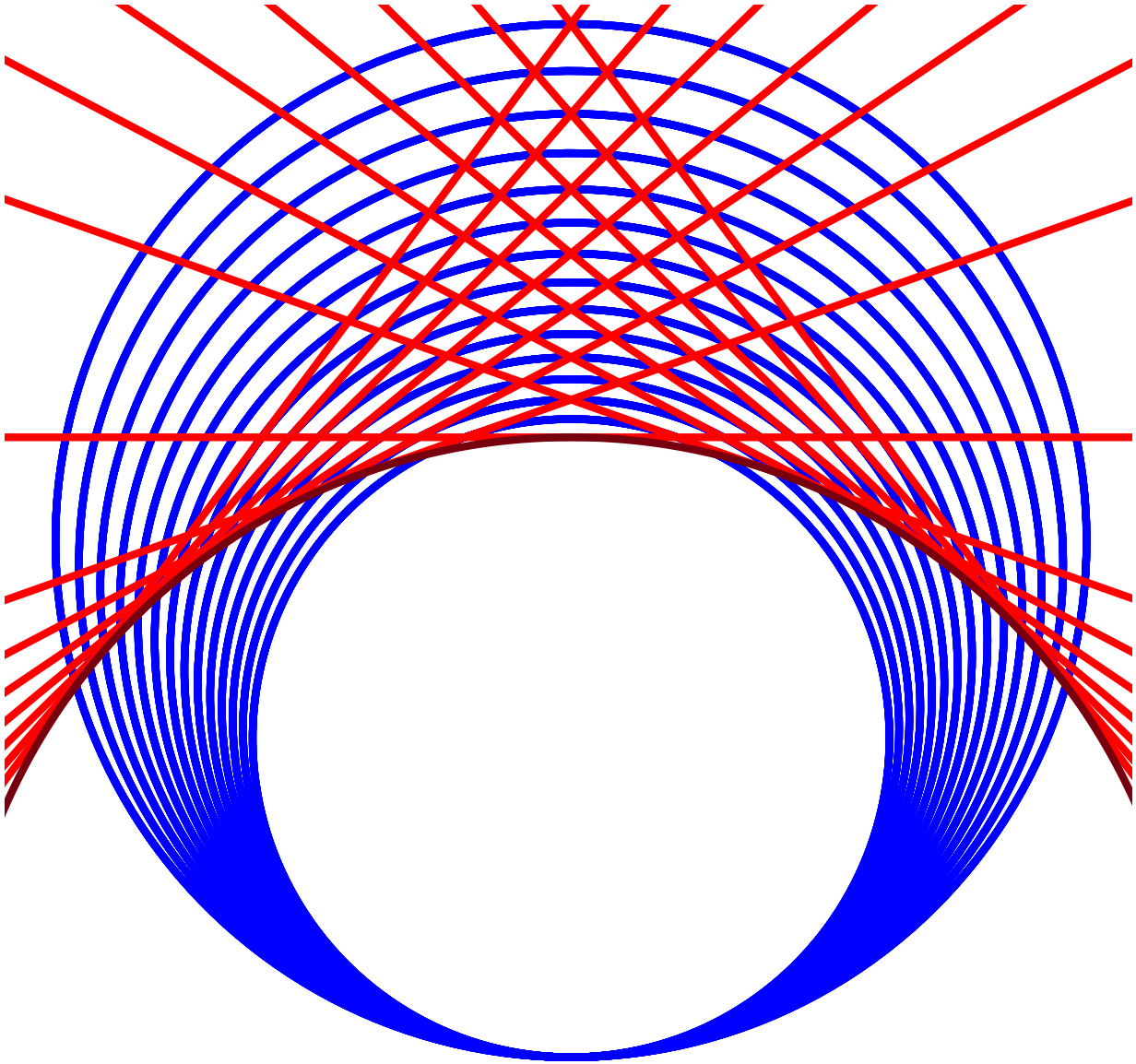
13. Hyperbolic pencil, conic plane touches Darboux quadric, symmetric



14. Elliptic pencil, conic plane touches Darboux quadric



15. Parabolic pencil, conic plane touches Darboux quadric



Reference

More detail in
Sergey I. Agafonov
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arxiv 2306.11707