

Triple planes that are K3 surfaces

Dino Festi

joint work in progress with Francesco Polizzi

Università degli Studi di Napoli “Federico II”

Computations on K3 Surfaces and Related Varieties

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Proposition

Let $f: X \rightarrow \mathbb{P}^2$ be a general triple plane with $p_g = 1$ and $q = 0$. Then

1. $9h + 15 = 4b^2 - 6b + K_X^2$;
2. $2h - 2 = b^2 - 3b$

The proof follows from the *formule di corrispondenza* due to Enriques and Severi and presented by Iversen in [Ive70].

The six cases

Case	K_X^2	$g(H)$	$\deg B$	# cusps of B
I	-1	3	10	18
II	-3	4	12	30
III	-4	5	14	45
IV	-4	6	16	63
V	-3	7	18	84
VI	-1	8	20	108

References

- [Ive70] Birger Iversen. “Numerical invariants and multiple planes”. In: *Amer. J. Math.* 92 (1970), pp. 968–996. ISSN: 0002-9327,1080-6377. DOI: 10.2307/2373405. URL: <https://doi.org/10.2307/2373405>.
- [FPV19] D. Faenzi, F. Polizzi, and J. Vallès. “Triple planes with $p_g = q = 0$ ”. In: *Trans. Amer. Math. Soc.* 371.1 (2019), pp. 589–639. ISSN: 0002-9947,1088-6850. DOI: 10.1090/tran/7276. URL: <https://doi.org/10.1090/tran/7276>.