



# Platonic configurations of points and lines\*

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## Abstract

We present some methods for constructing connected spatial geometric configurations  $(p_q, n_k)$  of points and lines, preserved by the same isometries of Euclidean space  $E^3$  as the predetermined Platonic solid. In this paper, we are mainly interested in configurations  $(n_3)$ ,  $(n_4)$ , and  $(n_5)$ , but also in unbalanced configurations  $(p_3, n_4)$ ,  $(p_3, n_5)$ , and  $(p_4, n_5)$ .

*Keywords:* Configuration of points and lines, symmetry group, Platonic solid, centrally symmetric solid, projection from a point.

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\*The authors appreciate the possibility to apply in their work on configurations the software GeoGebra that is freely available at <http://www.geogebra.org>. The authors would also like to thank anonymous referee for many helpful comments. The results in the article were presented at the Bled 2019 conference – Polytopes, Configurations, and Symmetries.

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# Platonske konfiguracije točk in premic\*

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## Povzetek

Predstavimo nekaj metod za konstruiranje povezanih prostorskih geometrijskih konfiguracij  $(p_q, n_k)$  točk in premic, ki jih ohranjajo iste izometrije evklidskega prostora  $E^3$ , ki ohranjajo tudi izbrano platonsko telo. V tem članku nas zanimajo predvsem konfiguracije  $(n_3)$ ,  $(n_4)$ , in  $(n_5)$ , pa tudi neuravnotežene konfiguracije  $(p_3, n_4)$ ,  $(p_3, n_5)$ , in  $(p_4, n_5)$ .

*Ključne besede: Konfiguracija točk in premic, simetrijska grupa, platonsko telo, centralno simetrično telo, projekcija iz točke.*

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