THEOREM OF THE DAY

The Classification of Semiregular Tilings There are eight semiregular tilings and three regular tilings of the Euclidean plane, specified as follows:

(1*) 3^6  (6) 3.6.3.6  (9) 4.8^2  (11*) 6^3
(2) 3^4.6  (7) 3.4.6.4  (10) 4.6.12
(3) 3^3.4^2  (8*) 4^4
(4) 3^2.4.3.4
(5) 3.12^2

* regular

Start with a regular polygon. At each vertex, extend the tiling by an identical cyclic arrangement of regular polygons. This cyclic arrangement is called a vertex configuration; in the notation used above, a cyclic sequence of k n-gons is abbreviated as n^k.

E.g., the configuration at vertex 9 above is 4, 8, 8, = 4.8^2.

Johannes Kepler classified the regular (configurations 1, 8 and 11) and semiregular tilings (also known as Archimedean) in chapter 2 of his 1619 Harmonices Mundi (in which also appears his third law of planetary motion). This classification was rediscovered independently by Paul Robin (in 1887), Alfredo Andreini (in 1905) and Duncan Sommerville (in 1906).

Web link: gruze.org/tilings/