

# QUEEN'S-MOVE GRAPHING REVISITED

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The February 1996 Word Ways introduced the concept of a queen's-move-graphable word: place the different letters of a word on a chessboard (extended beyond 8x8, if needed) so as to allow a chess queen to move horizontally, vertically or diagonally to spell out the word in question. Words that cannot be queen-graphed--and there are only a handful, even in the second or third editions of the unabridged Merriam-Webster--have graphs that can be reduced by elimination of superfluous nodes (letters) and links (queen's-moves between letters) to one or another of a small set of minimal non-queen graphs. A minimal non-queen graph is one which, if any single further link or node (with associated links) is removed, then becomes queen-graphable.

Most non-queen-graphable words have graphs that reduce to one of two minimal non-queen graphs, diagrammed below. In the first, all letter-pairs but one (AE) are linked; in the second, a sixth letter joins

four links apiece.

A	A + + F
B C D with BD joined	B C D + with FE joined
E (44433)	E (444332)

Words reducible to the first graph include insciences INSEC, intensities INTES, intratrinitarian INTRA, consciencewise ISCEN, stultiloquious UTOIL, untrinitarian INTRA, consubstantiationist INSTA, duodenoenterostomies OENTS, unsubduedness DESUN; words reducible to the second graph include (2-linked letter in lower case) spectrohelioscopic ePIOSC, pseudoprosperous uORPSE, antispectroscopic ePIOSC, antiecclesiastical LAISEC, protransubstantiation nORTIA, duodenopancreatectomy oNACET, intraorganization rOINTA, tracheochromatocerythroblast aRHOEC, pleurolophoceros lUERCO, gastroenterostomies nESORT, transubstantiationist oNSTAI.

There are a handful of Websterian words that reduce to more complex minimal non-queen graphs. Unconscientiousness and unprosperousness both reduce to the identical graphs below (all queen's moves but CO (or EO) are present)

S + + + E	N + + + P
U N C + with NE joined	U S E + with SP joined
O + I (5433333)	O + R (5433333)

The words tactinvariant, sacramentarianism, counterinsurgencies and haemospectrophotometer reduce to the following non-queen graphs which are believed to be minimal.

C N V  
T A with NI joined  
I R (6444222)  
(VR, CN not linked)

R  
T + E + I  
+ + + with UR joined  
S + N + C (65433322)  
U  
(TS, EC not linked)

T N S M  
I A with TA joined  
R C (74333222)  
(MC, SN not linked)

R + O H  
+ + P +  
T + E + M with HA joined  
(55433332)  
A  
(MA not linked)

Leonard Gordon notes that tactinvariant can be attractively S-graphed in the form of a 3-lobed pinwheel or windmill. It is curious how many of the words in this article have religious connotations. Can any reader find another minimal non-queen graph to which a word graph reduces? Or a word graph which reduces to two different minimal non-queen graphs?

It is obvious that any word that has a letter with nine or more other letters adjacent to it is not queen-graphable. Besides the 45-letter lung disease, supradiaphragmatically, epididymodeferentectomies, duodenocholecystostomy and choledochointerostomy appear to be the only such Websterian words.

The author is much indebted to Leonard Gordon for providing a list of likely words to test for non-queen-graphability (at least five more different bigrams than different letters), and to Dan Tilque for writing a program for testing any word for queen-graphability (as well as the more stringent king-graphability).