Pensieve header: An attempt to implement the Taft algebra and its double.

Conventions follow Montgomery, Schneider, “Skew derivations of finite-dimensional algebras and actions of the double of the Taft Hopf algebra”.

(1.1) $$H = k\langle g, x \mid g^n = 1, x^n = 0, xg = \omega g x\rangle,$$

$g \in G(H)$, and $\Delta(x) = x \otimes 1 + g \otimes x$, $\varepsilon(x) = 0$.

We now specialize to the n^2-dimensional Taft algebra $H = T_{n^2}(\omega)$ as in
In this case it is known that $H^* \cong H$; thus we may write

(4.2) $$H^* = k\langle G, X \mid G^n = \varepsilon, X^n = 0, XG = \omega G X\rangle$$

where $\Delta(G) = G \otimes G$, $\Delta(X) = X \otimes \varepsilon + G \otimes X$, $\langle G, 1\rangle = 1$, and $\langle X, 1$
$\varepsilon_{H^*}(X) = 0$.

The dual pairing between H and H^* is determined by

(4.3) $$\langle G, g\rangle = \omega^{-1}, \quad \langle G, x\rangle = 0, \quad \langle X, g\rangle = 0, \quad \text{and} \quad \langle X, x\rangle = 1.$$