Let $F(X)$ be a free group of finite rank. A *segment splitting* of $F(X)$ is a decomposition $F(X) \cong H *_{\mathbb{Z}} K$ where $H, K \leq F(X)$. Subgroups of $F(X)$ conjugate to H and K are called *vertex subgroups* after their characterization in terms of the free action of $F(X)$ on an infinite combinatorial tree. We discuss a combinatorial algorithm for identifying finitely generated subgroups of $F(X)$ which lie in a vertex group of some segment splitting of $F(X)$.