▶ **Problem 13.1-20 (b)**

Prove that every planar graph with $V \geqslant 3$ vertices has at least three vertices of degree $d \leqslant 5$..

Proof. We may assume that G is connected. Say there is only two vertices of degree at most 5. Then

$$\sum \deg v_i \geqslant 6(V-2) + 2 = 6V - 10$$

where "+2" because G is connected, so there are no vertices of degree 0. This contradicts to Theorem 13.1.4 that $\sum \deg v_i = 2E \leqslant 6V - 12$. □