Math589 Homework 1

1. [1pt] Find three graphs G_1, G_2, and G_3 such that
   - G_1 is a minor but not a topological minor of G_3, and
   - G_2 is a topological minor of G_3.

   Use *TikZ* to illustrate your graphs and explain your reasons.

   Solution.

2. [1pt] Let $\omega(G)$ be the clique number, the largest size of a clique in G. Define $\lfloor\omega\rfloor(G) = \min\{\omega(H) : H \text{ is IG}\}$. Find $\lfloor\omega\rfloor(G)$ for each G.

   Solution.

Questions to ponder:

1. Prove that if $\Delta(G) \leqslant 3$, then any IG contains an TG.
2. Describe an algorithm to test whether H is in IG. When G is small, e.g., K_1, K_2, K_3, P_2, P_3, is it easier?
3. Practice your TEXnique at `https://texnique.xyz/`.