1. Can you prove the above graph is chordal?

2. Start with an empty set $I$. Find a simplicial vertex $v$ in the above graph. Put $v$ in $I$ and remove its neighbors. Repeat. Stop when no vertices remain. Check that you have a maximum independent set.

A simplicial vertex elimination ordering of a graph $G$ with order $n$ is a listing of the vertices $v_1, v_2, \ldots, v_n$ such that, for each $i \in \{i, i+1, \ldots, n\}$, $v_i$ is a simplicial vertex in the graph $G[\{v_i, v_{i+1}, \ldots, v_n\}]$.

3. Find a simplicial vertex elimination ordering for the above graph.
**Greedy Coloring Algorithm:** Reverse the simplicial ordering and consider the graphs induced on the last vertex, then the last two vertices, etc. In general, let $G_i = G[\{v_{(n-i)+1}, \ldots, v_n\}]$, for $i \in \{1, 2, \ldots, n\}$. So $G_1 = G[\{v_n\}]$, $G_2 = G[\{v_{n-1}, v_n\}]$, $\ldots$, $G_n = G[\{v_1, v_2, \ldots, v_n\}]$. Color vertex $v_n$ in $G_1$ with color 1, color vertex $v_{n-1}$ in $G_2$ with color 2, color vertex $v_{n-2}$ in $G_3$ with the smallest available color of 1 and 2 or, if $v_{n-2}$ is adjacent to both $v_{n-1}$ and $v_n$ then use a new color (integer). In general color vertex $v_i$ in $G_{(n-i)+1}$ with the smallest available color, or if $v_i$ is adjacent to vertices using all previously used colors choose a new color.

4. Reverse your simplicial ordering.

5. Draw the graphs $G_1, \ldots, G_{10}$ as defined above.

6. Color each graph according to the Greedy Coloring Algorithm.

7. For each graph $G_i$, check that $\omega(G_i) = \chi(G_i)$.