5. What is the chromatic polynomial $P(G, x)$ of the following graph?

$$P\left(\begin{array}{c}
      1 \\
      2 \\
      3 \\
      4 \\
    \end{array}\right) = P\left(\begin{array}{c}
      1 \\
      2 \\
    \end{array}\right) - P\left(\begin{array}{c}
      1 \\
    \end{array}\right) = x(x-4) - (P(3) - P(4))$$

$$= x(x-1)^4 - x(x-1)^3 + x(x-1)(x-2)$$

6. Draw a graph with chromatic polynomial equal to $P(G, x) = x^4(x-1)^3(x-2)^3(x-3)^2(x-4)$

7. In a graph with 16 edges, what is the minimum possible number of vertices?

8. In a connected graph with 16 edges, what is the maximum possible number of vertices?