Read each problem **very carefully** before starting to solve it. Each problem is worth 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. Consider the function $f(x) = -x^2 + 6x - 5$.

   (a) Find the vertex.

   (b) Find the opening direction:

   (c) Find the y-intercept:

   (d) Find the x-intercepts:

   (e) Please, sketch the graph as clearly as you can, labeling all relevant points with their coordinates:

2. Solve the polynomial equation $x^4 - 21x^2 = 4x^3$.