Hints for CW 1

Q1)

C^n with Euclidean topology is homeomorphic to R^{2n}. In simpler terms, you can treat C^n as R^{2n} as far as Euclidean topology is concerned.

Q2)(b)

$y^3 - x^2$ is just an example of a closed affine algebraic variety. You can similarly prove that any closed affine algebraic variety in A^n is compact with Zariski topology.

Q3)(d)

You have a variety which is given as the intersection of hypersurfaces. To understand it, solve the equations like you did in high school:

$$y^2 - x^2 (x^2 +1) = 0$$

$$y = zx$$

and see what you get. To prove that different components are irreducible, you might use the idea from Q3(c) and Example 2.41 of the notes.

Q4)

Note that V ? V ? {a}.

(ii) Use Part (i) to write 1 as a linear combination of the generators with coefficients in $C[x_1, ..., x_{n+1}]$.