All the problems are from the text book by Griffiths.

1. Problem 4.1

2. Problem 4.6 Hint: use the method of images.

3. Problem 4.7 Hint: For simplicity, consider a uniform field $E = E\hat{y}$ and compute the work done in the following process. First bring the dipole $p$ from infinity to the origin along the $x$-axis keeping its orientation fixed parallel to $\hat{x}$. Once you have reached the origin, turn the dipole so that the final orientation of $p$ is at an angle $\theta$ to the $E$ field. Be careful about signs in calculating the work done done by you!

4. Problem 4.8

5. Problem 4.17. Hint: (i) To sketch the $E$ field lines, it is useful to first determine the equivalent bound charge densities in the bulk $\rho_b$ and on the surface $\sigma_b$. (ii) Be sure to make your sketches of $E$ and $D$ consistent with the boundary conditions discussed in Sec. 4.3.3.

6. Problem 4.18