In the present work the vacuum polarization and the circular dichroism of hydrogen-like atoms are studied. We derive equations for the Fourier transformation of the vacuum expectation value of the charge density. We use it to derive Uehling potential and calculate energy shifts caused by it. Then we discuss effects of vacuum polarization in higher orders of α. In second part we define circular dichroism and we express it in terms of reduced matrix elements. Then we derive the formula for parity vilating potential which is generated by weak interaction and together with other results we use it to find the expression for circular dichroism in terms of hydrogen radial functions.