Formation of Differential equation of higher order

1. Find the differential equation of the two-parameter family of conics $ax^2 + by^2 = 1$ where a and b are arbitrary constants.
2. Find the differential equation of the family of curves y = Ae^x + Be^x for different values of A and B Solution
3. Find the differential equation corresponding to the equation $y = ae^x + be^{2x}$+cAe^{-3x} where a, b, c are arbitrary constants.
4. Find the differential equation of all the hyperbolas whose axes are along both the axes.
5. Find the differential equation of the family of circles of radius 5cm and their centers lying on the x-axis.