Assume that the particle under the influence of an attractive force, where is the distance from a fixed point, then it moves in a plane through and the equation of motion is   
  
where is a constant, and is the angle the line from to the particle makes with some fixed direction in the plane.

A particle of mass 2 moves along the -axis and is attracted towards the origin by a force. If initially the particle is at, and is moving to the right with speed 30 find   
(a) the position of the particle at time,   
(b) the speed and the velocity of the particle at time,   
(c) the amplitude, period and frequency of the oscillations.