8.

$$\frac{dx}{dt} = \overset{\circ}{x}$$

$$\frac{dy}{dt} = \overset{\circ}{y}$$

$$\frac{d\overset{\circ}{x}}{dt} = -\frac{GMx}{r^3}$$

$$\frac{d\overset{\circ}{y}}{dt} = -\frac{GMy}{r^3}$$

where

$$r = \sqrt{x^2 + y^2}$$