

In[1]= Cartesian[x, y]

Out[1]= Cartesian[x, y]

In[2]= Fxbym[t] =

$$-\mu (1 - \nu) x[t] / (x[t]^2 + y[t]^2)^{3/2} - \mu \nu / ((x[t] - a)^2 + y[t]^2)^{3/2} (x[t] - a) + \mu / a^3 x[t] - \mu \nu / a^2 + 2 (\mu / a^3)^{1/2} y'[t]$$

$$\text{Out[2]} = -\frac{\mu \nu}{a^2} + \frac{\mu x[t]}{a^3} - \frac{\mu (1 - \nu) x[t]}{(x[t]^2 + y[t]^2)^{3/2}} - \frac{\mu \nu (-a + x[t])}{((-a + x[t])^2 + y[t]^2)^{3/2}} + 2 \sqrt{\frac{\mu}{a^3}} y'[t]$$

In[3]= Fybym[t] =

$$-\mu (1 - \nu) y[t] / (x[t]^2 + y[t]^2)^{3/2} - \mu \nu / ((x[t] - a)^2 + y[t]^2)^{3/2} y[t] + \mu / a^3 y[t] - 2 (\mu / a^3)^{1/2} x'[t]$$

$$\text{Out[3]} = \frac{\mu y[t]}{a^3} - \frac{\mu (1 - \nu) y[t]}{(x[t]^2 + y[t]^2)^{3/2}} - \frac{\mu \nu y[t]}{((-a + x[t])^2 + y[t]^2)^{3/2}} - 2 \sqrt{\frac{\mu}{a^3}} x'[t]$$

In[4]= Fxbym[t] /. {a -> 384 400, mu -> 403 548, nu -> 0.0121505}


$$\text{Out[4]} = -3.31835 \times 10^{-8} + \frac{100887 x[t]}{14200058896000000} - \frac{4903.31 (-384400 + x[t])}{((-384400 + x[t])^2 + y[t]^2)^{3/2}} - \frac{398645. x[t]}{(x[t]^2 + y[t]^2)^{3/2}} + \frac{\sqrt{100887} y'[t]}{59582000}$$

In[5]= Fybym[t] /. {a -> 384 400, mu -> 403 548, nu -> 0.0121505}

$$\text{Out[5]} = \frac{100887 y[t]}{14200058896000000} - \frac{4903.31 y[t]}{((-384400 + x[t])^2 + y[t]^2)^{3/2}} - \frac{398645. y[t]}{(x[t]^2 + y[t]^2)^{3/2}} - \frac{\sqrt{100887} x'[t]}{59582000}$$

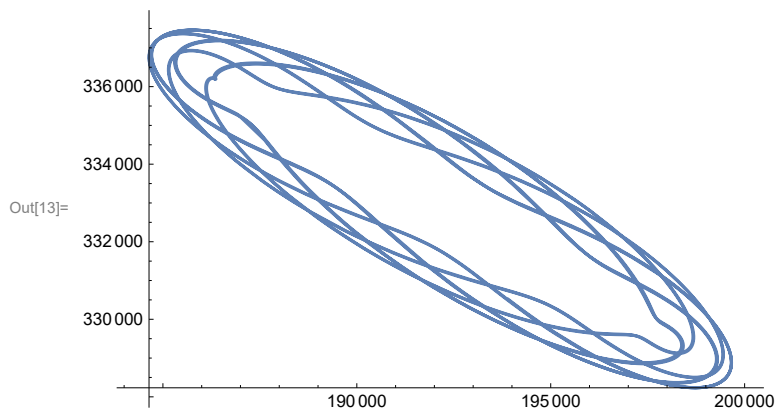
In[12]= sol = NDSolve[{x''[t] == (Fxbym[t] /. {a -> 384 400, mu -> 403 548, nu -> 0.0121505}),
微分方程式の数値解

y''[t] == (Fybym[t] /. {a -> 384 400, mu -> 403 548, nu -> 0.0121505}), x[0] == 186 361,
y[0] == 336 204, x'[0] == 0, y'[0] == 0}, {x[t], y[t]}, {t, 0, 100000000}]

Out[12]= {{x[t] -> InterpolatingFunction[ Domain: {{0., 1. x 10^8}} Output: scalar] [t],

y[t] -> InterpolatingFunction[ Domain: {{0., 1. x 10^8}} Output: scalar] [t]}}

In[13]:= **ParametricPlot[Evaluate[{x[t], y[t]} /. sol, {t, 0, 100000000}]]**
[パラメトリック…] [評価]



In[14]:= **Plot[x[t] /. sol, {t, 0, 100000000}]**
[プロット]

