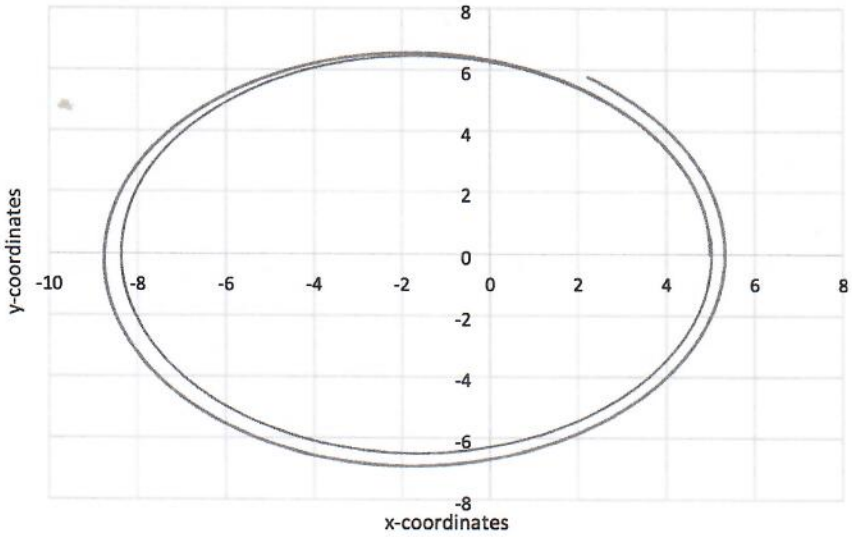

9) (5 pts) The planet simulation with Forward Euler numerical solution produced the above two orbits. What kind of error dominates numerical simulations of differential equations? Circle One:

Rounding Error : Precision Error : Truncation Error

10) (5 pts) In the above orbits, one simulation was done with time step $h = 0.01$ and one was done with time step $h = 0.1$. Which one is which (Orange/Green)?

Green → 0.1
Orange → 0.01

11) (5 pts) Rewrite this equation such that it is set up to be programmed as a fixed point method. Clearly indicate the equation $g(x)$.

$$2x^2 - 4x + 2 = 0$$

$$\frac{x^2+1}{2} - x = 0$$

$$g(x) = \frac{x^2+1}{2}$$

$$g'(x) = x$$

12) (5 pts) There is a root 'close' to 2. Pick one of your two equations from problem 11 and determine if you would converge on a root if your initial guess is 2. Use the convergence criterion.

$g(x) = \frac{x^2}{2} + \frac{1}{2}$

$g'(x) = x$

if $|g'(x^*)| > 1$, diverges

$|g'(2)| > 1$

$2 > 1$, the root diverges