

1. Using Newton's technique, find (to an 8 digit accuracy) as many solutions to

$$\exp \frac{x^2}{10} = \sin x + x + x^2$$

as possible.

2. Similarly, find a solution to

$$\frac{x^3}{2 + \sin y} = \frac{y^4}{3 + \cos x}$$
$$\frac{\exp(-x^2)}{1 + y^2} = (x - y)^3$$

starting at  $x = \frac{1}{2}$  and  $y = -1$ .

Find another, distinct solution to the previous set of equations.