Solve an algebraic equation

$f(x)=0$

numerically using the Newton's method, bisection method, and secant method. The solution should include all the roots, if any. Plot the graph and mark each solution. Show the derivative of function $f(x)$**.**

The type of the function is either polynomial or trigonometrical. The trig function is defined on an interval (the roots should be found within this interval).

Task #1 – Newton's for polynomial

Task #2 – Newton's for trig

Task #3 – bisection for polynomial

Task #4 – bisection for trig

Task #5 – secant for polynomial

Task #6 – secant for trig

polynomial: $f(x)=\sum_{i=1}^{n} c_i x^{n-i}$

```
n(ID) = series_NumerMeth(ID);
if n(ID) < 4
    n(ID) = 4;
end
if n(ID) > 6
    n(ID) = 6;
end
for k = 1:n(ID)
     c(ID, k) = ((-1)^series_NumerMeth(ID - 1 +
              + k))*series_NumerMeth(ID + 4 + k);
end

////////////////////////////////////////////////////
```

trig:

$f(x)=c_1 \cos x + c_2 x$ **on interval** $[0;\pi]$ **for even IDs**

$f(x)=c_1 \sin x + c_2 x$ **on interval** $\left[-\frac{\pi}{2};\frac{\pi}{2}\right]$ **for odd IDs**

```
c1 = 3*((-1)^series_NumerMeth(ID + 2))*
        *series_NumerMeth(ID);
c2 = ((-1)^series_NumerMeth(ID + 3))*
        *series_NumerMeth(ID + 1);
if abs(c1) < abs(c2)
    c2 = ((-1)^series_NumerMeth(ID + 2))*
                    *series_NumerMeth(ID);
c1 = 3*((-1)^series_NumerMeth(ID + 3))*
                    *series_NumerMeth(ID + 1);
end
if abs(c1) == abs(c2)
    c1 = c1*2;
end
```